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January 2020

### 3D Printing Creative



Home > Materiali > Windform P2, nuovo termoplastico caricato con fibre di vetro

## Windform P2, nuovo termoplastico caricato con fibre di vetro

15 Gennaio 2020



Crp Technology ha rilasciato il nuovo materiale Windform P2, un poliammide termoplastico caricato fibre di vetro dalle elevate proprietà meccaniche creato per il processo di stampa 3D professionale di sintetizzazione ad alta velocità, High Speed Sintering.

Come spiega Franco Cevolini, vice presidente e direttore tecnico di Crp Technology in una nota, si tratta del secondo polimero della P-Line, la nuova gamma Windform per la produzione in serie di componenti di piccole dimensioni, varata meno di un anno fa.

Rispetto al primo materiale della famiglia, il P1, il Windform P2 si caratterizza per l'aumentata rigidezza: il modulo elastico del nuovo materiale è 2.925,20 MPa; mentre del Windform® P1 è 1.960,60 MPa.

Questa caratteristica si combina a un elevato carico di rottura: 39,24 MPa.

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3D printing creative  
gloved!

Quella che vogliamo raccontare è una storia da ascrivere al capitolo Covid-19  
che comincia con il filo, che forza...

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## Il Progettista Industriale

# il progettista industriale

**APPLICATIONS**  
Riccardo Fioretto

OF PRODUCING EXCELLENCE

L'INGEGNERIA INVERSA NELLA STAMPA 3D

info@fioretto.com

ADDITIVE NOW

RICOSTRUZIONE DI PEZZI USURATI ATTRAVERSO L'INGEGNERIA INVERSA, LA MANIFATTURA ADDITIVA E I MATERIALI COMPOSITI. ECCO COME LE TECNOLOGIE AVANZATE POSSONO CONSENTIRE ALLE AZIENDE DI RISPARMIARE TEMPO E DENARO. IL CASO DELLA RICOSTRUZIONE DIGITALE E STAMPA CON SINTERIZZAZIONE LASER SELETTIVA DI UNA STAFFA DI FISSAGGIO ROTTATA PER LA QUALE NON ERA DISPONIBILE UN RICAMBIO.

**U**na delle frontiere più interessanti della stampa 3D, sul lato pratico e nella vita lavorativa di tutti i giorni è quella della costruzione di pezzi di ricambio. Probabilmente in un futuro nemmeno troppo lontano ci sarà una netta riduzione della disponibilità di pezzi sostitutivi già pronti per una macchinetta di caffè o di un centro di lavoro a controllo numerico, i cui produttori per legge sono tenuti a fornire i ricambi anche dopo averne cessato la produzione. I magazzini di questi ricambi sono costosi e un riparatore deve tenerne una certa quantità in magazzino, sapendo che magari una piccola guarnizione non verrà mai richiesta. La soluzione più ovvia è quella che i riparatori o le aziende abbiano a disposizione semplicemente il modello digitale del ricambio e possano stamparlo in 3D soltanto quando serve. C'è molta strada per arrivare a questo, ovvero a un "magazzino digitale" di modelli e di una diffusione capillare di stampanti 3D, ma non

per questo l'industria sta con le mani in mano, soprattutto quando i ricambi "ufficiali" non sono più disponibili e non c'è altra strada che costruirseli in casa. Pensiamo ad esempio alla manopola di una radio vintage o la leva di accensione di un vecchio ma ancora funzionante tomò. In ogni caso l'attesa troppo lunga per un ricambio può comportare, in una realtà produttiva, un ritardo nel ciclo di lavoro con tutti gli effetti collaterali che questo può comportare.

La staffa di fissaggio di un attuatore elettronico lineare per la movimentazione di un frangisole di grandi dimensioni si era rotta in tre parti e il pezzo di ricambio non era più disponibile.

il progettista industriale  
GENNAIO 2020

25



## Meccanica Plus



Home > Mercato > Motorsport elettrico e additivo a Oxford con CRP Technology

# Motorsport elettrico e additivo a Oxford con CRP Technology

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Pubblicato il 23 gennaio 2020

**CRP Technology** è stata invitata lo scorso ottobre come relatore alla due giorni dedicata all'uso dei **materiali compositi del Motorsport**, presso il Williams F1 Conference center di **Oxford**. L'azienda ha portato la propria esperienza in **fabbricazione additiva** presentando una relazione sulla spinta che l'uso di materiali compositi in additivo conferisce all'evoluzione del settore del **motorsport elettrico**.



Le aziende CRP supportano da decenni il motorsport nel trarre vantaggio dai processi additivi e sottrattivi più avanzati. La presentazione è stata occasione per analizzare l'uso di materiali compositi ad alte prestazioni per **stampa 3D nel motorsport elettrico**, focalizzato sulla connessione tra CRP e la moto **Energica**, prima super sportiva elettrica italiana.

L'uso di fabbricazione additiva e dei materiali compositi Windform di CRP Technology è stato quindi cruciale nello sviluppo della moto Energica, inclusa la **Ego Corsa**, versione da gara che monta diversi pezzi realizzati in stampa 3D da CRP Technology e con **lavorazioni meccaniche di alta precisione a CNC** da CRP Meccanica, e di cui 18 esemplari stanno gareggiando nella FIM Enel MotoE World Cup.

L'impiego di processi avanzati e additivi ha anche permesso, lo scorso marzo, di affrontare brillantemente una situazione di crisi, quando i **preparativi per la FIM Enel MotoE World Cup** hanno subito una battuta d'arresto, a causa di un incendio che aveva distrutto gran parte del materiale, comprese le 18 Ego Corsa. Prima della fine di maggio, e grazie anche al supporto offerto da CRP Technology e CRP Meccanica, in un **tempo record di meno di tre mesi** Energica ha potuto infatti ricostruire tutte le Ego Corsa, garantendo così il corretto svolgimento del Campionato.

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## AM Chronicle



# How 3D printing and composite materials help streamlining SAE competition results

1 week ago · 25 Views · 3 Min Read



I3DPN Core Team

I3DPN Core Team



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3D printed oil pan in Windform XT 2.0. University of Victoria's Formula SAE race cars 2017-2018

The oil pans for the 2016, 2017 and 2018 vehicle were printed using Carbon-composite material Windform® XT 2.0.

It worked "amazingly" (verbatim) on the 2016 and 2017 race car as the 3D printed oil pans allowed UVic team to significantly lower the engine, and thus decrease the vehicles overall centre of gravity improving the performance of the car.



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JEC Composites



## How 3D printing and composite materials help streamlining SAE competition results

International

French

29 JAN 2020



For the last four years of SAE competition, UVic Formula Motorsport team has been using 3D printed oil pans that were purposely engineered to be manufactured by CRP USA's laser sintering 3D printing process and Windform Top-Line composite materials.



*3D printed oil pan in Windform SP, University of Victoria's Formula SAE race car 2019 version*

The oil pans for the 2016, 2017 and 2018 vehicle were printed using carbon-composite material Windform XT 2.0.

It worked well on the 2016 and 2017 race car as the 3D printed oil pans allowed UVic team to significantly lower the engine, and thus decrease the vehicles overall centre of gravity improving the performance of the car.

The use of laser sintering technology also allowed UVic Formula Motorsport team to create a more complex geometry due to the ease in manufacturability. This allowed team to incorporate baffles within the pan to get rid of the possibility of oil starvation during cornering.

However, during a test day with their 2018 vehicle, the engine overheated causing the oil temperature to increase beyond the

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## 3D Adept

3D ADEPT MEDIA

> 3D Printing News > How 3D printing and composite materials help streamlining SAE competition results

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# How 3D printing and composite materials help streamlining SAE competition results

January 29, 2020

For the last four years of SAE competition, UVic Formula Motorsport team has been using 3D printed oil pans that were purposely engineered to be manufactured by CRP USA's laser sintering 3d printing process and Windform® TOP-LINE composite materials.



The oil pans for the 2016, 2017 and 2018 vehicle were printed using Carbon-composite material Windform® XT 2.0.

It worked "amazingly" (verbatim) on the 2016 and 2017 race car as the 3D printed oil pans allowed UVic team to significantly lower the engine, and thus decrease the vehicles overall centre of gravity improving the performance of the car.

The use of laser sintering technology also allowed UVic Formula Motorsport team to create a more complex geometry due to the ease in manufacturability. This allowed team to incorporate baffles within the pan to get rid of the possibility of oil starvation during cornering.

However, during a test day with their 2018 vehicle, the engine overheated causing the oil temperature to increase beyond the limits of the designed pan. During the post inspection it was found that any thin walled surfaces deformed quite significantly, meaning that the baffle walls of the pan were significantly warped, and one of the sections of the mating flange had

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3D Adept Media

3D ADEPT MEDIA

## CRP Technology lance un nouveau matériau d'impression 3D pour la technologie HSS

janvier 13, 2020



CRP Technology a dévoilé un nouveau matériau d'impression 3D pour la technologie HSS (*High Speed Sintering process*). Baptisé **Windform® P2**, ce matériau est un polyamide thermoplastique renforcé de fibres de verre.

L'ingénieur **Franco Cevolini**, directeur technique et vice-président de CRP Technology, déclare « *le Windform® P2 est le deuxième polymère de P-LINE, la nouvelle gamme de matériaux Windform® pour l'impression 3D de qualité production à grande vitesse, introduite sur le marché il y a moins d'un an.* »

Pour rappel, **Windform® P1** est le premier matériau de la famille P-LINE du fabricant. Le nouveau matériau se distingue de son prédécesseur par ses propriétés mécaniques accrues : une rigidité accrue (le module de traction du Windform® P2 est de 2925,20 MPa tandis que le Windform® P1 est de 1960,60 MPa), combinée à une résistance à la traction élevée (39,24 MPa, Windform® P2).

« *C'est – ajoute l'ingénieur Franco Cevolini – une propriété très importante. Le Windform® P2 est plus rigide que le Windform® P1 car le Windform® P2 est renforcé (le Windform® P1 n'est pas renforcé). La plupart des matériaux renforcés pour des technologies similaires actuellement sur le marché, montrent une diminution de la propriété de résistance à la traction. Mes collaborateurs et moi-même avons pu conserver la haute résistance à la traction du Windform® P2. Par conséquent, la performance globale du Windform® P2 est supérieure à celle des matériaux similaires actuellement sur le marché pour des technologies similaires.* »

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## 3D Printing Industry



A thumbnail image for a news article. It features a dark background with a large, semi-transparent white text area in the center. The text reads: "CRP TECHNOLOGY RELEASES HIGH SPEED SINTERING MATERIAL, WINDFORM P2". At the top of this white area, there is a small grey box labeled "MATERIALS". At the bottom, it says "TIA VIALVA - JANUARY 13TH 2020 - 9:42AM" followed by a share icon and a comment icon.

[CRP Technology](#), an Italian engineering and 3D printing company, has released its latest additive manufacturing powder for High-Speed Sintering (HSS) known as Windform P2.

As the second polymer from the company's [P-Line](#), the new Windform range of materials for high-speed production-grade 3D printing, P2 is a glass fiber reinforced thermoplastic polyamide material distinguished by increased stiffness.

Franco Cevolini, CTO and VP of CRP Technology, said, "Most of the reinforced materials for similar technologies currently on the market show a decrease in the tensile strength property. We have been able to preserve the high tensile strength in Windform P2. Therefore, performance is superior."

### Windform P2

Last year, CRP Technology introduced its first material from the P-Line with Windform P1, a non-conductive, isotropic material in powdered form with strong mechanical properties and flexibility. This material is compatible with HSS 3D printing methods utilized by [voxeljet](#), and [Xaar](#).

Windform P2 has been designed for the production of small functional prototypes, as well as consumer, household, and industrial products. This includes furniture parts, fixtures and tooling, and electrical enclosures. It also manufactures components with detailed resolution. Cevolini added, "We are pursuing non-stop

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Polimerica

# Polimerica

Attualità e notizie dal mondo della plastica

## PA con fibra vetro per la stampa 3D

CRP Technology ha sviluppato Windform P2, tecnopolimero ottimizzato per processi di sinterizzazione ad alta velocità.

14 gennaio 2020 08:47

La società modenese **CRP Technology** ha sviluppato **Windform P2**, poliammide caricata con fibre di vetro per la manifattura additiva mediante **sinterizzazione ad alta velocità** (HSS), secondo grado della serie **P-LINE** per la produzione di componenti funzionali di piccole dimensioni introdotta in catalogo nei mesi scorsi ([leggi articolo](#)).



Rispetto a Windform P1, il nuovo grado si caratterizza per una **maggior rigidezza** (modulo elastico di 2.925,20 MPa contro 1.960,60MPa di P1), combinata con un **elevato carico di rottura**, pari a 39,24MPa. "Si tratta di una caratteristica molto importante - spiega **Franco Cevolini**, vice presidente e direttore tecnico di CRP Technology -. Windform P2 è più rigido del precedente perché è una poliammide rinforzata (a differenza del grado P1, privo di rinforzo): mentre la maggior parte dei materiali caricati fibra vetro presenti sul mercato per tecnologie simili manifesta un calo nel carico di rottura, siamo riusciti a mantenere questo valore elevato e la performance complessiva Windform P2 risulta quindi superiore".

Essendo caricato con fibra di vetro, Windform P2 è anche **isolante** (CTI indice di resistenza alla traccia pari a 600) e - afferma la società modenese - consente di realizzare rapidamente componenti funzionali per **piccoli lotti** in volumi maggiori e con **costi più bassi** rispetto alla sinterizzazione laser selettiva. Inoltre, questo tecnopolimero è idoneo per la produzione di particolari con un alto livello di **dettaglio**.

I principali **settori di applicazione** sono: componenti rigidi per interni auto; alloggiamenti, cover e contenitori per componenti elettronici; beni di consumo e prodotti per la casa; componenti industriali, attrezzi ed utensili, modelli e prototipi.

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EPPM

# EUROPEAN

PLASTIC  
PRODUCT MANUFACTURER

14 January 2020 10:04

## CRP Technology launches Windform P2 for HSS technology

by Rob Coker

[RSS](#) [Print](#)

CRP Technology, a leading company in the creation of prototypes and final applications in professional 3D printing, launches Windform P2 material.



Windform P2 is a glass fibre-reinforced [thermoplastic](#) polyamide material with excellent mechanical properties for High Speed Sintering (HSS).

Engineer Franco Cevolini, CRP Technology CTO and VP, said: "Windform P2 is the second polymer from P-LINE, the new Windform range of materials for high-speed production-grade 3D printing, introduced on the market less than a year ago."

Compared to Windform P1, P2 is distinguished by increased stiffness (Windform P2 Tensile Modulus is 2925.20 MPa; Windform P1 is 1960.60 MPa), combined with high tensile strength (39.24 MPa, Windform P2).

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TCT



THE MAGAZINE FOR  
DESIGN-TO-MANUFACTURING  
INNOVATION

13 January 2020 12:10

## *CRP Technology launches second material in High Speed Sintering portfolio*

“We are pursuing non-stop innovation on the road to high tech for production manufacturing.”

by Sam Davies



**CRP Technology** has announced the introduction of Windform P2, a glass fibre-reinforced thermoplastic polyamide optimised for the High Speed Sintering (HSS) process.

The Windform P2 is CRP's second offering through its P-Line series of production grade 3D printing materials. CRP says the new material has excellent mechanical properties and is ideal for functional prototypes and end-use components.

Windform P2 has been designed to be a stiffer material than the Windform P1, which was released last April as [CRP announced the P-Line portfolio](#). The P2 boasts a tensile modulus of 2925.20 MPa compared to the P1's 1960.60 MPa and has a tensile strength of 39.24 MPa. Thanks to its glass fibre reinforcement, the W2 is also an insulating material with a CTI rating of 600.

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3DRuck



# Windform P2: CRP Technology bringt neues Material für die HSS-Technologie auf den Markt

von David - Jan 13, 2020



**Das italienische Unternehmen CRP Technology ist seit über 25 Jahren auf professionellen 3D-Druck spezialisiert. Nun stellt die Firma ein neues Material aus der Windform P-LINE-Reihe vor, das speziell für den Hochgeschwindigkeits-Produktionsdruck (HSS) entwickelt wurde.**

Windform P2 ist ein glasfaserverstärkter thermoplastischer Polyamidwerkstoff mit hervorragenden mechanischen Eigenschaften für den Hochgeschwindigkeits-3D-Druck (High Speed Sintering Prozess, HSS). Im Vergleich zu Windform P1, dem ersten Material aus der P-LINE Familie, zeichnet sich Windform P2 durch eine erhöhte Steifigkeit (Windform P2 Zugmodul ist 2925,20 MPa; Windform P1 ist 1960,60 MPa), kombiniert mit einer hohen Zugfestigkeit (39,24 MPa, Windform P2) aus.

Verstärkte Materialien für ähnliche Technologien haben oft schlechtere

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3Printr.com



## CRP Technology launches Windform® P2, thermoplastic glass fiber filled material for HSS technology

By Press Releases - Jan 13, 2020

ICRP Technology, a leading company in the creation of prototypes and final applications in professional 3D printing, launches Windform® P2 material.



Windform® P2 is a glass fiber reinforced thermoplastic polyamide material with excellent mechanical properties for High Speed Sintering process.

Engineer Franco Cevolini, CRP Technology CTO and VP, states: "Windform® P2 is the second polymer from P-LINE, the new Windform® range of materials for high speed production-grade 3D printing, introduced on the market less than a year ago. " Compared to Windform® P1, which is the first material from P-LINE family, Windform® P2 is distinguished by increased stiffness (Windform® P2 Tensile Modulus is 2925.20 MPa ; Windform® P1 is 1960.60 MPa), combined to high tensile strength (39.24 MPa, Windform® P2).

"This is – Engineer Franco Cevolini adds – a very important property. Windform® P2 is stiffer than Windform® P1 because Windform® P2 is reinforced (Windform® P1 is not reinforced). Most of the reinforced materials for similar technologies currently on the market, show a decrease in the tensile strength property. My staff and I have been able to preserve the high tensile strength in Windform® P2. Therefore, Windform® P2 overall's performance is superior than the performance of similar materials currently on the market for similar technologies. "

As Windform® P2 is glass fiber filled, it is an insulating material (CTI rating of 600).

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## New material from CRP for High Speed Sintering

16th January 2020 | Jon Lawson | [Twitter](#) [LinkedIn](#) [Google](#) [Facebook](#) [+1](#) 0

**CRP Technology** has launched Windform P2, a glass fibre-reinforced thermoplastic polyamide material for the High Speed Sintering process.



Engineer Franco Cevolini, CRP Technology CTO and VP, stated: "Windform P2 is the second polymer from P-LINE, the new Windform range of materials for high speed production-grade 3D printing, introduced on the market less than a year ago."

Compared to Windform P1, which is the first material from the family, it is distinguished by increased stiffness (Windform P2 Tensile Modulus is 2925.20 MPa; Windform P1 is 1960.60 MPa), combined with high tensile strength (39.24 MPa, Windform P2).

Cevolini explained, "This is a very important property. Windform P2 is stiffer than Windform P1 because it is reinforced (Windform P1 is not). Most of the reinforced materials for similar technologies currently on the market show a decrease in the tensile strength property. My staff and I have been able to preserve the high tensile strength in Windform P2."

It is an insulating material (CTI rating of 600) and it is also suitable for manufacturing components with detailed resolution. It's designed for the production of small functional prototypes, end-use parts requiring high stiffness across a variety of sectors, like electrical enclosures and housing for electronics and automotive parts for interiors.

Read more about 3D printer materials [here](#).

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## 3D Ruck



Home > Industrie > Windform P2: CRP Technology bringt neues Material für die HSS-Technologie auf den...

INDUSTRIE MATERIALIEN

# Windform P2: CRP Technology bringt neues Material für die HSS-Technologie auf den Markt

von David - Jan 13, 2020



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Verstärkte Materialien für ähnliche Technologien haben oft schlechtere Zugfestigkeitseigenschaften. Laut eigenen Angaben der Entwickler konnte Windform P2 jedoch die hohe Zugfestigkeit erhalten. Daher soll die Gesamtleistung von Windform P2 besser als die Leistung ähnlicher Materialien, die derzeit auf dem Markt für ähnliche Technologien erhältlich sind.

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Polimerica

# Polimerica

Attualità e notizie dal mondo della plastica

## In corsa con coppe olio stampate in 3D

I componenti sono stati prodotti mediante sinterizzazione laser selettiva di un composito in fibra di carbonio fornito dalla modenese CRP Technology.

28 gennaio 2020 08:45

Negli ultimi quattro anni, il team **UVic Formula Motorsport** dell'Università di Victoria ha gareggiato nella **Formula SAE** montando sulle sue vetture **coppe dell'olio** realizzate mediante **stampa 3D** di materiali **compositi** caricati con fibra di carbonio forniti da **CRP Technology**.

Prodotte dalla consociata CRP USA utilizzando il processo di **sinterizzazione laser selettiva** (SLS), le coppe hanno permesso al team UVic Formula Motorsport di ottenere una **geometria più complessa**, grazie alla libertà di forma e progettazione, e di inserire speciali **paratie** che garantiscono la piena disponibilità di olio in ogni condizione, anche in curva.

Le coppe dell'olio per le auto da corsa che hanno gareggiato nel 2016, 2017 e 2018 sono state stampate nel materiale composito caricato fibra di carbonio **Windform XT 2.0**. Tuttavia, durante i test sull'auto da corsa 2018, il motore si è surriscaldato causando un **aumento della temperatura dell'olio** oltre i limiti supportati dalla coppa. Durante l'ispezione post-test, è emerso che le superfici più sottili della coppa potevano deformarsi originando una fuoriuscita significativa di olio.

Per la vettura da gara del 2019, quindi, è stato selezionato un altro materiale della famiglia Top-Line, sempre caricato fibra di carbonio, il grado **Windform SP**, che presenta un punto di fusione più alto rispetto al Windform XT 2.0: **193,3 °C** contro **179,3 °C**. Per ridurre le possibilità di guasti, i progettisti hanno aumentato lo spessore della **flangia di accoppiamento** al fine di irrobustire il pezzo e montato una flangia di alluminio per distribuire la pressione dei bulloni su una più vasta area di contatto.

Inoltre, per risolvere il problema delle deformazioni delle pareti del **deflettore** dovute all'elevato calore, il team UVic Formula Motorsport le ha ridotte ad una sola **centrale** situata intorno alla raccolta dell'olio e ha aggiunto una **struttura di supporto**





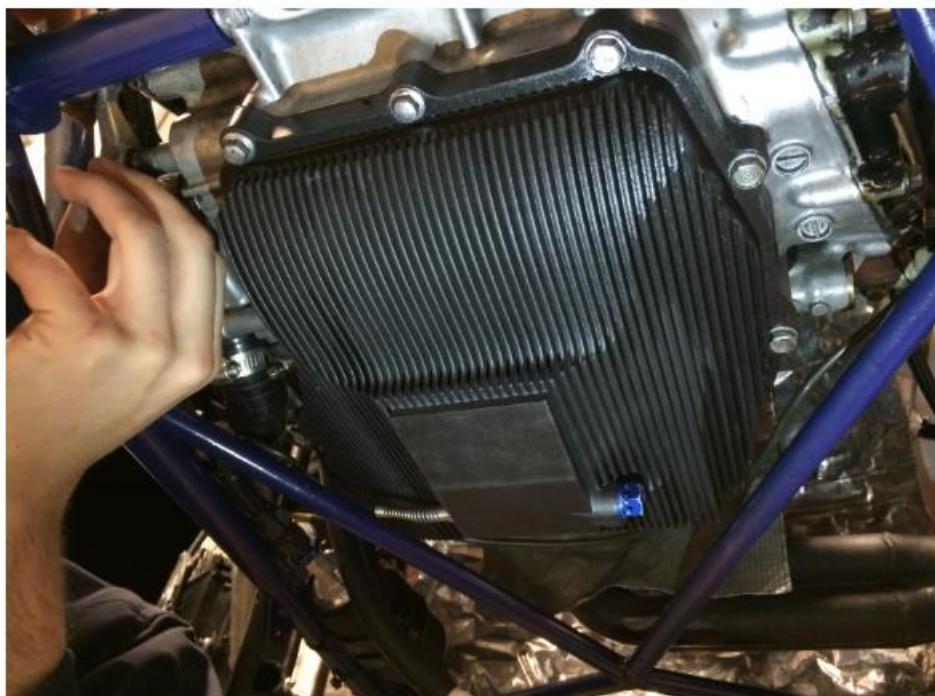
## Inside Composites



28th January 2020, Modena, Italy

### Designing complex parts not previously possible

0 comment



3D printed oil pan in Windform XT 2.0, setting up phase. University of Victoria's Formula SAE race car 2016 version. © CRP.

For the last four years of SAE competition, the UVic Formula Motorsport team has been using 3D printed oil pans that were purposely engineered to be manufactured by CRP USA's laser sintering 3d printing process and Windform TOP-LINE composite materials.

The oil pans for the 2016, 2017 and 2018 vehicle were printed using Carbon-composite material Windform XT 2.0.

"It worked amazingly on the 2016 and 2017 race car as the 3D printed oil pans allowed UVic team to significantly lower the engine, and thus decrease the vehicles overall centre of gravity improving the performance of the car," the company reports.

The use of laser sintering technology also allowed UVic Formula Motorsport team to create a more complex geometry due to the ease in manufacturability. This allowed team to incorporate baffles within the pan to get rid of the possibility of oil starvation during cornering.

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Home > Settori verticali > Automotive e aerospaziale > Formula SAE, le coppe dell'olio sono stampate in 3D

## Formula SAE, le coppe dell'olio sono stampate in 3D

29 Gennaio 2020



Negli ultimi quattro anni il team **UVic Formula Motorsport** ha gareggiato nella [Formula SAE](#) con coppe dell'olio realizzate in stampa 3D.

Le coppe sono state appositamente progettate per essere realizzate da Crp Usa, attraverso il processo di sinterizzazione laser selettiva e nei materiali compositi **Windform Top-Line** di Crp Technology.

Le coppe dell'olio per l'auto da corsa del 2016, 2017 e 2018 sono state stampate nel materiale

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## 3D Adept

3D ADEPT MEDIA

# Comment l'impression 3D et les matériaux composites ont fourni des résultats différents au concours SAE

By **Yosra K.** - janvier 29, 2020

Au cours des quatre dernières années de compétition SAE, l'équipe **UVic Formula Motorsport** a utilisé des carters d'huile imprimés en 3D qui ont été spécialement conçus pour être fabriqués par le procédé d'impression 3D par frittage laser de CRP USA et les matériaux composites Windform® TOP-LINE.



Les carters d'huile des véhicules de 2016, 2017 et 2018 ont été imprimés avec le matériau composite au carbone Windform® XT 2.0.

Cela a fonctionné de manière "étonnante" sur la voiture de course de 2016 et 2017, car les carters d'huile imprimés en 3D ont permis à l'équipe UVic d'abaisser considérablement le moteur, et donc de diminuer le centre de gravité global du véhicule, améliorant ainsi les performances de la voiture.

L'utilisation de la technologie de frittage laser a également permis à l'équipe **UVic Formula Motorsport** de créer une géométrie plus complexe en raison de la facilité de fabrication. Cela a permis à l'équipe d'incorporer des déflecteurs dans le plateau pour éliminer la possibilité de manque d'huile pendant les virages.

Cependant, lors d'une journée de test avec leur véhicule 2018, le moteur a surchauffé, ce qui a fait augmenter la température de l'huile au-delà des limites du carter conçu. Au cours de l'inspection, il a été constaté que les surfaces à parois minces se déformaient de manière significative, ce qui signifie que les parois du carter étaient fortement déformées et qu'une des sections de la bride d'accouplement avait été tirée dans le carter, créant une fuite

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**February 2020**

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## Composites World



2/3/2020 | 2 MINUTE READ

# 3D printing, composite materials enable motorsports design flexibility

A collegiate Formula SAE racing team used Windform carbon fiber-filled composite materials and laser sintering technology to streamline part design.



EDITED BY **HANNAH MASON**  
Assistant Editor, CompositesWorld



This 3D-printed composite oil pan was built using Windform SP material for the University of Victoria's 2019 SAE racecar. Source | CRP Technology

A combination of 3D printing technology and composite materials has enabled one university motorsports team the opportunity to design — and redesign — parts for its Formula SAE collegiate racecars for the past four years.

Since 2016, the University of Victoria Formula Motorsport team (UVic; Victoria, British Columbia, Canada) has been designing its Formula SAE racing vehicles with 3D-printed oil pans engineered with CRP USA's (part of CRP Group, Modena, Italy) laser sintering 3D printing process and Windform TOP-LINE composite materials.

From 2016-2018, the oil pans were produced using CRP's polyamide-

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## 3D Adept

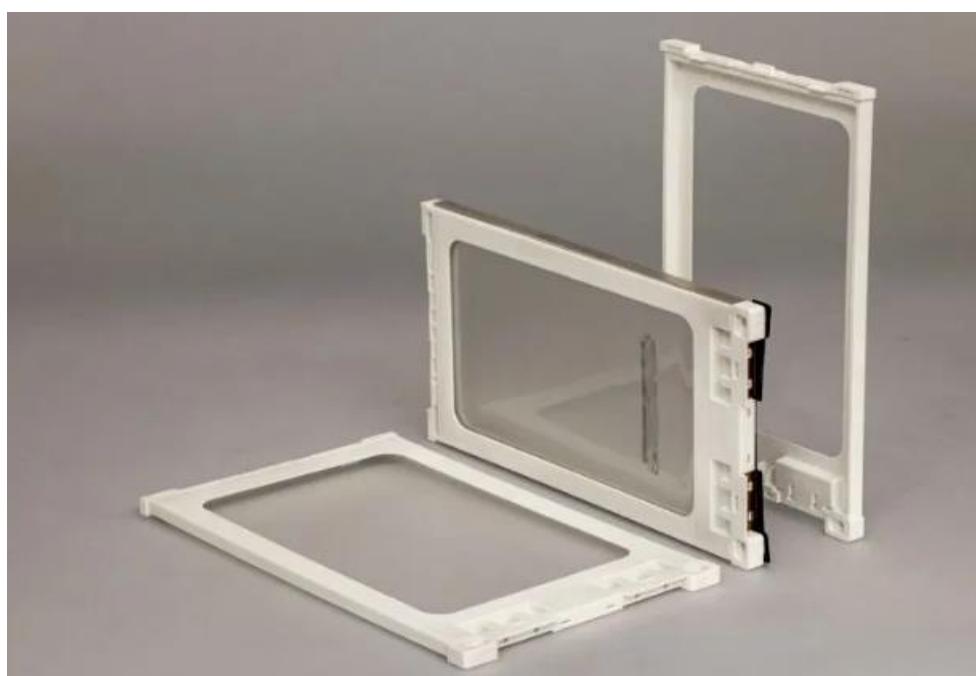
### 3D ADEPT MEDIA

> 3D Printing News > CRP Technology adds another additive manufacturing composite material to its TOP-LINE family

[3D Printing News](#) [Additive Manufacturing news](#) [Materials](#)

## CRP Technology adds another additive manufacturing composite material to its TOP-LINE family

February 12, 2020



In January, CRP Technology kicked off the year with the launch of [Windform® P2](#), a glass fiber reinforced thermoplastic polyamide material. The Italian producer continues its material developments with the release of Windform® FR2, another composite material from the TOP-LINE family compatible with the SLS technology.

[Unveiled in July 2019](#), the Windform® FR1 is carbon fiber-reinforced flame-retardant material that is similar to the company's new material in terms of flame-retardance.

The main differences between both materials are their properties: the Windform® FR1 is **carbon fiber reinforced** and dark gray with regards to color.

The Windform® FR2 on the other hand, is **glass fiber** reinforced, off-white with regards to color, and electrically insulating. Furthermore, this product is a halogen free polyamide-based material, which combines outstanding wear resistance and good temperature

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## Windform FR2, ritardante di fiamma per SLS

12 Febbraio 2020



A meno di sei mesi dal lancio sul mercato del **Windform FR1**, il primo ritardante di fiamma caricato fibra di carbonio per stampa 3D professionale, Crp Technology presenta il materiale per Sinterizzazione Laser Selettiva **Windform FR2**.

Windform FR2 è un materiale composito a base poliammidica **ritardante di fiamma caricato fibra di vetro**.

Si distingue dal Windform FR1 per alcune caratteristiche: materiale di rinforzo (vetro, rispetto al carbonio del FR1), colore (bianco, mentre il FR1 è grigio scuro), comportamento elettrico (il Windform FR2 è elettricamente isolante), finitura superficiale superiore e più liscia al tatto.

Windform FR2 ha **superato i test di infiammabilità FAR 25.853**: resistenza alla fiamma verticale per 12 secondi, resistenza alla fiamma orizzontale per 15 secondi, test di infiammabilità con bruciatore di Bunsen con angolo a 45°, test smoke density.

Per Franco Cevolini, vice presidente e direttore tecnico di [Crp Technology](#), "i ritardanti di fiamma non

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AEROSPACE  
MANUFACTURING

## CRP Technology unveils Windform FR2 3D printing composite material

24 FEBRUARY 2020 • In News



CRP Technology, one of the leaders in the field of advanced technologies and professional 3D printing, has launched on the market the first flame-retardant and glass fibre reinforced material for Selective Laser Sintering (SLS).

Less than six months after the launch on the market of Windform FR1, the first carbon fibre-reinforced flame-retardant material for professional 3D printing, CRP Technology is presenting a new composite material from the TOP-LINE family of composite materials for SLS: Windform FR2.

Windform FR2 is a Flame Retardant polyamide-based glass fibre reinforced material. Owing to its flame-retardant quality and insulating properties, Windform FR2 is suitable for aerospace applications.

Windform FR2 diverges from Windform FR1 on some properties, including: reinforcement material (Windform FR2 is glass fibre reinforced, Windform FR1 is carbon fibre reinforced), colour (Windform FR2 is off-white, Windform FR1 is dark gray), electrical behaviour (Windform FR2 is electrically insulating), smoother surface finish.

Windform FR2 passed successfully the FAR 25.853 12-second vertical and 15-second horizontal flammability tests as well as the 45° Bunsen burner test and Smoke density test.

Glass Fiber reinforced flame retardant LS material  
INSULATING AND FAR 25.853 COMPLIANT



"CRP Technology constantly produces technological breakthroughs and highest-level solutions," commented Franco

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## CRP Technology unveils Windform FR2 3D printing composite material

24 FEBRUARY 2020 • In [News](#)



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Glass Fiber reinforced flame retardant LS material  
INSULATING AND FAR 25.853 COMPLIANT



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## Aerospace Manufacturing and Design



### Glass-fiber reinforced material for SLS

February 25, 2020

CRP Technology

<https://www.crptechnology.com/>



3D/Additive/Alternative Materials

CRP Technology launches [Windform FR2](#), a flame-retardant, glass-fiber reinforced material for selective laser sintering (SLS) 3D printing. Windform FR2 is halogen-free polyamide-based material, which combines wear and temperature resistance.

Windform FR2 differs from Windform FR1 on its reinforcement material: Windform FR2 is glass-fiber reinforced, Windform FR1 is carbon-fiber reinforced); color (Windform FR2 is off-white, Windform FR1 is dark gray); electrical behavior (Windform FR2 is electrically insulating), and has smoother surface finish for good detail resolution.

Windform FR2 passed successfully the FAR 25.853 12-second vertical and 15-second horizontal flammability tests as well as the 45° Bunsen burner test and smoke density test.

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## Satellite Evolution



# CRP Technology introduces Windform® FR2, cutting-edge 3D printing composite material for aircrafts and aerospace applications

February 24, 2020 by Satellite Evolution Group



CRP Technology's hi-tech advancement is unstoppable. Less than six months after the launch on the market of Windform® FR1, the first carbon fiber-reinforced flame-retardant material for professional 3D printing, CRP Technology is presenting a new composite material from the TOP-LINE family of composite materials for SLS: Windform® FR2.

Windform® FR2 is a Flame Retardant polyamide-based glass fiber reinforced material. Owing to its flame-retardant quality and insulating properties, Windform® FR2 is suitable for Aircrafts and Aerospace applications.

Windform® FR2 diverges from Windform® FR1 on some properties, including: reinforcement material (Windform® FR2 is glass fiber reinforced, Windform® FR1 is carbon fiber reinforced), color (Windform® FR2 is off-white, Windform® FR1 is dark gray), electrical behavior (Windform® FR2 is electrically insulating), smoother surface finish.

Windform® FR2 passed successfully the FAR 25.853 12-second vertical and 15-second horizontal flammability tests as well as the 45° Bunsen burner test and Smoke density test.

"CRP Technology constantly produces technological breakthroughs and highest level solutions – commented Franco Cevolini, VP and CTO at CRP Technology - Only a few months ago we launched Windform® FR1, flame retardant carbon fiber reinforced material. Now we introduced Windform® FR2, a flame retardant material which is glass fiber reinforced. Flame retardants are not new to the 3D printing market but flame retardant materials which were also reinforced and presenting significant mechanical properties, lacked. We at CRP Technology were the first to fill this void; we have created not only the first material of its kind, but now two. In order invent these materials, we must anticipate, intercept and satisfy the requests of the most demanding and innovative industrial sectors."



Windform® FR2 is halogen free polyamide based material, which combines outstanding wear resistance and good temperature resistance.

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**March 2020**

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3D Printing Creative



## Sviluppo di veicoli elettrici con la stampa 3D

25 Marzo 2020



Primo costruttore di moto elettriche supersportive italiano, [Energica Motor Company](#) si pone anche come attore di prima mossa nel globale mercato dei veicoli elettrici.

Con la designazione a costruttore unico per la **FIM Enel MotoE™ World Cup**, la coppa del mondo dedicata a moto elettriche, la cui prima edizione si è conclusa poco tempo fa con la vittoria di **Matteo Ferrari** del team Gresini, lo sviluppo tecnologico di Energica ha avuto un'accelerazione.

Come top player del mercato dei veicoli elettrici Energica si avvale di partner tecnici in grado di produrre innovazione tecnologica e nuove soluzioni di altissimo livello in tempi stretti.

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## Engine Technology International



CRP Technology produces cell pouch test frames

0

BY SAM PETTERS ON 19TH MARCH 2020

ENGINE COMPONENTS, TESTING

Italy-based supplier CRP Technology has manufactured cell pouch frames for Energica Motor Company to test on battery pack prototypes for both race and production vehicles.

The cell pouch frames were created using laser sintering technology and composite flame-retardant material.

Supersport electric motorcycle manufacturer Energica uses high-energy lithium-polymer batteries, which are contained in a sealed housing that features the battery management and safety systems.

To carry out the tests required, the Energica engineers provided each pouch cell with a surrounding case, with the function of support and reinforcement. To test the battery pack prototype on the road, the casing of each pouch cell was manufactured using a high-performance material.

Following the requirement examination and 3D file analysis of the application, CRP Technology opted to use selective laser sintering technology with Windform FR2.

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**AddMag**  
FASZINATION ADDITIVE FERTIGUNG



Foto: CRP Technology

3D PRINTING ▾ 20. März 2020

## 3D-Druck bei der Entwicklung von Elektrofahrzeugen

Wie die CRP Technology Zellbehälter für den Prototyp eines Batteriepacks aus Verbundmaterial durch selektives Lasersintern herstellt.

CRP Technology, ein Unternehmen, das seit über 25 Jahren aktiv im Bereich des professionellen 3D-Drucks mit Windform-Materialien ist hat die Energica Motor Company Spa bei der Forschung und Entwicklung von Zellenhaltern für Tests an Prototyp-Batteriepacks für Energica Renn- und Straßenmotorräder unterstützt. Energica ist ein führender Hersteller von Supersport-Elektromotorrädern "Made in Italy" und ein Anbieter auf dem wachsenden Markt der Elektrofahrzeuge.

### Die Herausforderung

Die Motorräder von Energica verfügen über eine besonders leistungsstarke Lithium-Polymer-Batterie (Li-NMC). Die Batterie sitzt in einer hermetischen Hülle, die die Zellen, das Batterie-Management-System BMS (Battery Management System) und alle zur Gewährleistung der Fahrzeugsicherheit erforderlichen Vorrichtungen beinhaltet. Darüber hat Energica ein Kühlsystem der hermetischen Hülle zur Vermeidung einer Überhitzung der Batterien entwickelt, patentiert und an seinen Motorräder installiert. Dank spezifischer Belüftungskanäle

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**April 2020**

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UNITRONICS

### CRP Meccanica and CRP Technology alongside Energica for the FIM Enel MotoE™ World Cup

Visit [crptechnology.com](http://crptechnology.com) for further information

CRP Meccanica and CRP Technology made available their technological expertise to Energica during the off season to get ready for the MotoE™ event

04/06/20, 05:23 AM | Additive & 3D Printing, Design & Development | CRP Technology

Energica Motor Company once again will be providing the Ego Corsa machines - and technical support - for the 18 riders and twelve teams entering the FIM Enel MotoE™ World Cup competition in 2020.

#### More Headlines

NEW QUARTER-TURN FASTENER FROM SOUTHCOCO DESIGNED FOR USE IN TIGHT SPACES

Objectify and TAGMA join hands to launch webinars to promote adoption of Additive Manufacturing



Although the forced stop due to Covid-19 disease will lead to a reprogramming of the 2020 sporting events calendars, the work "behind the track" for Energica and its suppliers began many months ago, reaching its climax in the weeks immediately following the end of the 2019 Championship.

CRP Meccanica and CRP Technology were still proudly alongside Energica as technological partner.

CEO and CTO CRP Meccanica and CRP Technology, Eng. Franco Cevolini, commented, "As Energica's technological and financial incubator, CRP firms have been supporting the development of Energica Ego Corsa for the 2019 competition. We are still working

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Tecn'è LAB

## TECNelAB

### La stampa 3D di CRP Technology al servizio dello sviluppo di veicoli elettrici

01/04/2020 46 volta/e



Condividi Articolo



Contenitori di celle di tipo pouch realizzati da CRP Technology con procedimento di stampa 3D professionale e materiale Windform® FR2 per pacco batteria prototipale destinato a Energica Motor Company.

CRP Technology ha realizzato contenitori di celle" per test su pacchi batteria prototipali delle moto Energica sia da gara che da strada. I porta-celle sono prodotti con Sinterizzazione Laser Selettiva e il materiale composito Windform® FR2.

di Amedeo Torri

Primo costruttore di moto elettriche supersportive Made in Italy, Energica Motor Company S.p.A. è tra le società più attive da sempre nel mercato dei veicoli elettrici. Con la designazione a costruttore unico per la FIM Enel MotoE™ World Cup – la coppa del mondo dedicata a moto elettriche – lo sviluppo tecnologico di Energica ha avuto un'importante accelerazione, potendo contare su un elemento di competitività unico rappresentato dalla stessa MotoE. Energica è, infatti, l'unica azienda al mondo ad avere un banco di prova esclusivo per testare nuove soluzioni tecniche con i migliori piloti. Un supporto che si è rivelato senza precedenti per il dipartimento di Ricerca e Sviluppo di Energica, sia per l'esperienza racing sia per quella sulle moto di serie.

Essere tra i top player del mercato dei veicoli elettrici vuol dire avvalersi di partner tecnici in grado di produrre costantemente innovazione tecnologica e nuove soluzioni di alto livello in tempi molto ristretti: fin dalla sua fondazione, Energica si è avvalsa della collaborazione di CRP Technology, da oltre 25 anni specializzata nel campo della stampa 3D professionale con i materiali Windform®, nata dalla visione imprenditoriale della famiglia Cevolini.

Il caso applicativo seguente spiega come CRP Technology abbia assistito Energica nella ricerca e nello sviluppo di soluzioni porta-celle per test su pacchi batteria prototipali delle moto Energica, per modelli sia da gara che da strada.



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PRESS RELEASES

## CRP Technology alongside Energica for the FIM Enel MotoE™ World Cup

By [Press Releases](#) - Apr 7, 2020



**CRP Technology made available its technological expertise in Additive Manufacturing to Energica during the off season to get ready for the MotoE™ event**

Energica Motor Company once again will be providing the Ego Corsa machines – and technical support – for the 18 riders and twelve teams entering the FIM Enel MotoE™ World Cup competition in 2020.

Although the forced stop due to Covid-19 disease will lead to a reprogramming of the 2020 sporting events calendars, the work "behind the track" for Energica and its suppliers began many months ago, reaching its climax in the weeks immediately following the end of the 2019 Championship.

CRP Technology were still proudly alongside Energica as technological partner.

VP and CTO CRP Technology, Eng. Franco Cevolini, commented, "As Energica's technological and financial incubator, CRP Technology have been supporting the development of Energica Ego Corsa for the 2019 competition. We are still working alongside Energica to reach a new season as superb as the past one."

Energica, the single manufacturer of the series, has been working hard during the off season to get ready for the MotoE™ event and the same have been doing CRP Technology.

"The Ego Corsa – added Eng. Cevolini – is the state-of-the-art electric racing motorcycle developed by Energica. Ego Corsa shares common ground with the road-going Ego, which was created and engineered through the support of CRP Technology's expertise. Our innovative and avant-garde solutions in the field of Additive Manufacturing technology, especially Selective Laser Sintering process with our Windform 3D printing materials, have



TecneLAB

# TECNELAB

## Le aziende CRP al fianco di Energica per la Coppa del Mondo FIM ENEL MotoE™ 2020

0 15/04/2020 222 volta/e

Condividi Articolo



L'official test rider di Energica, Alessandro Brannetti, durante gli ultimi test ufficiali della Coppa del Mondo FIM ENEL MotoE™ a Jerez. L'Ego Corsa monta alcune parti realizzate da CRP Meccanica e CRP Technology. Foto: Jesus Robledo per Energica.

CRP Meccanica e CRP Technology hanno lavorato insieme a Energica Motor Company mettendo a disposizione il loro know-how tecnologico in vista della seconda stagione della Coppa del Mondo FIM ENEL MotoE™. Per la stagione 2020, Energica fornirà anche le moto da gara Ego Corsa, insieme al supporto tecnico alle 12 squadre e ai 18 piloti impegnati nella competizione.

Sebbene lo stop forzato causa Covid-19 porterà a una riprogrammazione dei calendari degli eventi sportivi 2020, il lavoro "dietro le quinte" per Energica e i suoi fornitori è iniziato molti mesi fa, raggiungendo il culmine nelle settimane immediatamente successive alla chiusura del Campionato 2019.

Al fianco di Energica non potevano mancare CRP Meccanica e CRP Technology: "In qualità di incubatori tecnologici e finanziari, abbiamo sempre fornito a Energica la nostra expertise, anche nello sviluppo della moto Ego Corsa per il campionato 2019. Ma il nostro impegno non si è mai fermato, e abbiamo continuato ad affiancare Energica nello sviluppo e progettazione delle Ego Corsa per la nuova stagione, che sarà all'altezza, se non migliore, della passata", dichiara l'Ing. Franco Cevolini, CEO e Direttore Tecnico di CRP Meccanica e CRP Technology.

Essere tra i top player del mercato dei veicoli elettrici vuol dire avvalersi di partner tecnici in grado di produrre costantemente innovazione tecnologica e nuove soluzioni di altissimo livello in tempi molto ristretti.

"Tutti i modelli Energica e, così, anche la Ego Corsa, sono stati creati, progettati e costruiti con il supporto di CRP Meccanica e CRP Technology. Le soluzioni innovative e all'avanguardia nel campo della fabbricazione additiva di CRP Technology e delle lavorazioni meccaniche di alta precisione a CNC di CRP Meccanica hanno reso Energica un modello unico al mondo, consentendole di essere scelta da Dorna per la nuova era della competizione motoristica elettrica su due ruote", continua l'Ing. Cevolini.

Tornando alla MotoE™, dal 10 al 12 marzo 2020 si è svolto a Jerez il primo dei due test ufficiali. Oltre ai piloti



## Meccanica Plus



Home > Mercato > Porta celle in additivo CRP Technology per moto elettriche Energica

# Porta celle in additivo CRP Technology per moto elettriche Energica

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Pubblicato il 20 aprile 2020

**CRP Technology** ha realizzato in stampa 3D dei contenitori di celle per pacco batteria prototipale delle moto elettriche di **Energica Motor Company**. Entrambe nate dalla visione imprenditoriale della famiglia Cevolini, le due aziende collaborano fin dalla nascita di Energica, azienda che vanta un **esclusivo banco di prova** per testare nuove soluzioni tecniche per le migliori moto elettriche super sportive al mondo.

Le moto Energica ad alte prestazioni si avvalgono di **batterie a polimeri di litio** ad alta energia (Li-NMC). L'azienda ha nello specifico chiesto a CRP Technology di creare un **contenitore prismatico di sostegno e rinforzo** per ogni singola cella 'pouch' di un particolare **pacco batteria prototipale**, per vari test e prove su strada. Dopo attenta analisi delle esigenze di Energica, CRP Technology ha optato per impiegare la tecnologia di **sinterizzazione laser selettiva con il materiale Windform FR2**, composito della famiglia Windform TOP-Line ritardante di fiamma e caricato fibra di vetro.



Il materiale plastico, non conduttivo elettricamente, rigido, resistente in temperatura e flame retardant ha soddisfatto a pieno le caratteristiche funzionali richieste per le custodie delle celle. In particolare, Windform FR2 garantisce l'**autoestinguenza necessaria in caso di anomalie**, che potrebbero sfociare in picchi di tensione temporanei con conseguente fusione localizzata, seguita da un principio di combustione.

Altra importante caratteristica offerta è quindi la **rigidezza**, fondamentale in questo tipo di applicazione per garantire la **stabilità e la posizione delle celle** poste in sequenza nel pacco batterie prototipale. Il porta cella deve infatti avere una certa resistenza per contenere

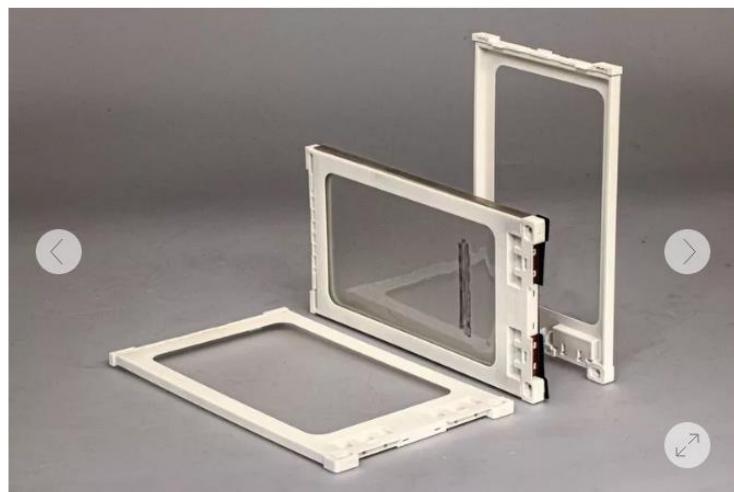


## Mission Additive

3D-Druck

# Sechs Neuheiten für die additive Fertigung

28.04.2020 | Redakteur: Lilli Bähr



Das neue Verbundmaterial für die 3D-Drucktechnologie verbindet laut CRP Technology eine hohe Verschleißfestigkeit mit einer guten Temperaturbeständigkeit.  
(Bild: CRP Technology)

2/6

### 2. Schwer entflammbar Material

**CRP** Technology bringt ein neues **Verbundmaterial für die 3D-Drucktechnologie** auf den Markt, das schwer entflammbar und glasfaserverstärkt ist.

Windform FR2 ist das zweite Material aus der Familie der Flame-Retardant-Windform-Top-Line für die von **CRP** Technology entwickelte additive Fertigung.

Das Verbundmaterial ist ein weißes, mit Glasfaser verstärktes, flammhemmendes Material auf Polyamidbasis. Das elektrisch isolierende Material verbindet eine hohe Verschleißfestigkeit mit einer guten Temperaturbeständigkeit. Windform FR2 verfügt laut Hersteller über die Entflammbarkeitsklasse HB bei Probenstärken von 1 mm und 3 mm (nach UL 94).



EPPM European Plastic Product Manufacturer

# EUROPEAN

PLASTIC  
PRODUCT MANUFACTURER

6 April 2020 11:54

## CRP Technology and Energica prepare for MotoE 2020

[RSS](#) [Print](#)

CRP Technology made available its technological expertise in additive manufacturing to Energica during the off season to get ready for the MotoE event.



*Jesus Robledo for Energica*

Energica official tester Alessandro Brannetti during the latest official MotoE test of the 2020 FIM Enel MotoE World Cup at Jerez. The Ego Corsa counts some parts manufactured by CRP Meccanica (using Subtractive Manufacturing technology) and CRP Technology (using Additive Manufacturing and Windform composite materials).

Energica will provide the Ego Corsa machines, as well as technical support, for the 18 riders and twelve teams entering the FIM Enel MotoE World Cup competition in 2020.

Although the forced stop due to Covid-19 disease will lead to a reprogramming of many sporting events, the behind-the-scenes preparation began months ago, reaching its climax in the weeks immediately following the end of the 2019 Championship.

CRP Technology VP and CTO Eng. Franco Cevolini said: "As Energica's



## 3D Printing Industry



A screenshot of a news article from 3D Printing Industry. The title is "CRP CONTINUES TO SUPPORT ENERGICA AS MOTOE WORLD CUP RESCHEDULED". The article is categorized under "AUTOMOTIVE". At the bottom, it shows the author "ANAS ESSOP", the publication date "APRIL 06TH 2020 - 6:08PM", and the number of comments "0".

Italian electric motorbike manufacturer [Energica](#) will once again be providing its Ego Corsa motorcycles and technical support for the [FIM Enel MotoE World Cup](#) competition in 2020. Originally set to begin on 26 March 2020, the event organizers have been forced to reschedule the race calendar in response to the coronavirus pandemic. Replacement dates are yet to be determined.

As with the [inaugural MotoE World Cup](#) that took place last year, Italian 3D printing materials manufacturer CRP Technology has been acting as Energica's technology partners since planning for the 2020 races began a few months back.

VP and CTO CRP Technology, Eng. Franco Cevolini, commented, "As Energica's technological and financial incubator, CRP Technology have been supporting the development of Energica Ego Corsa for the 2019 competition. We are still working alongside Energica to reach a new season as superb as the past one."



Test ride of the Energica Ego Corsa. Photo via CRP Technology

### CRP Group and Energica

A subsidiary of the CRP Group, Energica was founded by the company in 2010 with



## Additive Manufacturing AMazing

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+ APRIL 12, 2020

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### CRP Technology Alongside Energica for the FIM Enel MotoE™ World Cup

*CRP Technology made available its technological expertise in Additive Manufacturing to Energica during the off season to get ready for the MotoE™ event*

Energica Motor Company once again will be providing the Ego Corsa machines – and technical support – for the 18 riders and twelve teams entering the FIM Enel MotoE™ World Cup competition in 2020.

Although the forced stop due to Covid-19 disease will lead to a reprogramming of the 2020 sporting events calendars, the work “behind the track” for Energica and its suppliers began many months ago, reaching its climax in the weeks immediately following the end of the 2019 Championship.

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Energica, the single manufacturer of the series, has been working hard during the off season to get ready for the MotoE™ event and the same have been doing CRP Technology.



Official test rider, Alessandro Brannetti (Photo courtesy of CRP Technology)

“The Ego Corsa – added Eng. Cevolini – is the state-of-the-art electric racing motorcycle developed by Energica. Ego Corsa shares common ground with the road-going Ego, which was created and engineered through the support of CRP Technology’s expertise. Our innovative and avant-garde solutions in the field of Additive Manufacturing technology, especially Selective Laser Sintering process with our 3D printing materials, have made Energica a unique model throughout the world, allowed Energica to be chosen by Dorna for the new era of electric motorcycle racing.”

On March 10-12 the first of the two official tests were held at Jerez helping the riders and teams get up to speed



3D Printing Creative



Home > Settori verticali > Automotive e aerospaziale > Fase 2: come Energica e Crp si preparano a una stagione di...

## Fase 2: come Energica e Crp si preparano a una stagione di gare elettriche

22 Aprile 2020



**Energica Motor Company** fornirà anche per la stagione 2020 le moto da gara Ego Corsa e il supporto tecnico ai 18 piloti e dodici squadre impegnati nella **Coppa del Mondo Fim Enel MotoE™**.

Lo stop causa **Covid-19** porterà a una riprogrammazione dei calendari degli eventi sportivi 2020, ma il lavoro dietro le quinte per Energica e i suoi fornitori è iniziato molti mesi fa, raggiungendo il culmine nelle settimane immediatamente successive alla chiusura del Campionato 2019 e in quelle pre-pandemia.

Sono del 12 marzo gli ultimi test ufficiali di MotoE svoltisi a Jerez. Oltre ai piloti e ai team impegnati nel prossimo campionato mondiale, è scesa in pista anche l'unità di test di Energica. Il suo pilota-collaudatore ufficiale, **Alessandro Brannetti**, ha così potuto portare avanti il lavoro di sviluppo dell'Ego Corsa, motocicletta che monta parti e applicazioni realizzate dalle [aziende Crp](#).

*"In qualità di incubatori tecnologici e finanziari, abbiamo sempre fornito ad Energica la nostra expertise, anche nello sviluppo della moto Ego Corsa per il campionato 2019 – dice l'Ingegner **Franco Cevolini**, Ceo e Direttore Tecnico di CRP Meccanica e CRP Technology - . Ma il nostro impegno non si è mai fermato, e*



## Manufacturing Tomorrow



Online Trade Magazine - Industry 4.0  
Advanced Manufacturing and  
Factory Automation

*There is no doubt that 3D Printing is shaping our societies. Its future is evolving very fast and, although its impact on different sectors is still to be defined, many industries are leveraging 3D Printing technologies for their goals.*

A photograph of a small, cylindrical satellite with a metallic, multi-faceted exterior, likely a CubeSat, floating in the dark void of space. Below this image is a dark rectangular banner containing white text.

**Successful Mission of TuPOD, 3D Printed Innovative CubeSat**

Case Study from | CRP Technology

04/21/20, 05:30 AM | Additive & 3D Printing, Design & Development | CRP Technology | Additive Manufacturing, Aerospace



### Aerospace industry is one of these.

Indeed, Aero field is experiencing a renaissance set by the ever-increasing production and launch of small satellites as smallsats provide a responsive alternative to larger, more expensive satellites.

Additive manufacturing technologies not only helped this radical change to be fulfilled, but have itself reached new heights with the manufacture of structural components for the new generation of Space parts using high performance composite materials.

Although much still must be done to reach an extensive use of additive manufacturing for Space applications, CRP Technology and its US-based partner CRP USA have built a considerable experience supplying cutting-edge solutions for space key industry leaders.

As demand grows, CRP Technology and CRP USA have noticed that engineers adapt these "nanosatellites" or CubeSats to provide new achievements and goals.

One of these achievements is deploying TubeSats from International Space Station (ISS).

TubeSats are cylindrical-shaped nanosatellites, not much bigger than an ordinary beverage can, and are not compatible with normal CubeSats deployer platform (P-POD) on ISS, thus, an innovative nanosatellite, TuPOD (Tubesat-POD), was developed to address the challenge.

TuPOD inaugurated a new era for scientists wanting to use small, highly reliable satellites. It



Engine Builder Mag

# ENGINEBUILDER

## ENGINE NEWS

### **COMPANY-BY-COMPANY CORONAVIRUS RESPONSE: UPDATE**



By Engine Builder  
on Apr 24, 2020

Racing businesses and manufacturers have altered production, including making PPEs and medical supply components, during the ongoing COVID-19 pandemic. Below are the latest updates on different industry companies' responses to the pandemic.

#### **CRP Technology**

CRP Technology is manufacturing several functional prototypes of emergency valves for reanimation devices and link-components for emergency respiratory masks for assisted ventilation. The CRP Technology's Rapid Prototyping Department has used the 3D printing technology called HSS (High Speed Sintering) and the Windform P1 isotropic material to make both types of components.



**Press Office Manager**  
**Veronica Negrelli**  
[www.crp-group.com](http://www.crp-group.com) – [www.windform.com](http://www.windform.com)

**May 2020**

## Il Progettista industriale



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### La stampa 3D aiuta i satelliti tascabili PocketQube

Riccardo Fioretto 14/05/2020



AlbaPod 2.0 al Rocket Lab Electron per l'ultima fase pre-lancio. Courtesy of Alba Orbital.

Alba Orbital si è rivolta a CRP Technology per la costruzione di un innovativo sistema di rilascio in orbita dei "satelliti tascabili" PocketQube, delle dimensioni di cinque centimetri cubi. Il risultato è AlbaPod 2.0, il deployer interamente costruito in stampa 3D professionale e Windform XT 2.0 per il rilascio dei picosatelliti più avanzati al mondo.

Si chiama PocketQube e rappresenta la nuova frontiera dei piccoli satelliti per la ricerca spaziale. L'idea originale del PocketQube è stata concepita dal professor Robert J. Twiggs della Morehead State University (MSU), che ha proposto lo standard di "un satellite che può stare in tasca". In effetti, un PocketQube è un tipo di satellite miniaturizzato di circa 5 centimetri cubi (un ottavo del volume di un CubeSat), e con una massa che non supera i 250 grammi. Si tratta di una tipologia di satelliti alquanto giovane – i primi risalgono al 2009 – ma l'importanza del PocketQube cresce a ritmi incessanti, come soluzione alternativa ai lanci sempre più costosi di CubeSat nell'orbita terrestre bassa. Il primo standard risale a giugno 2018, quando è stata rilasciata una piattaforma condivisa; tra i fautori di questa piattaforma (con GAUSS Srl e TU Delft) c'è Alba Orbital, una PMI high-tech



## Industrial lasers



HOME | ADDITIVE MANUFACTURING

# Partnership manufactures satellite deployer using additive manufacturing

Additive manufacturing specialist CRP Technology has been working with Alba Orbital to build an updated deployer for PocketQube satellites.

Author – David Belforte

May 29th, 2020



A 3D-printed AlbaPod 2.0 in Windform XT 2.0 is shown.

(Courtesy: Alba Orbital)

Alba Orbital (Glasgow, Scotland) provides support for PocketQube satellites by building platforms and providing parts and launch to other space companies around the world. As such, the company needed to build an updated version of its AlbaPod 2.0 PocketQube satellite deployer, improving on previous designs in terms of weight, manufacturability, and access, and incorporate a number of safety features.

Additive manufacturing specialist CRP Technology (Modena, Italy) has been working with Alba Orbital to build an updated deployer for PocketQube satellites. These miniature satellites, derived from an idea from Professor Robert J. Twigg at Morehead State University (MSU; Morehead, KY) to build “a satellite that fits in your pocket,” are designed to carry out space research with lower launch costs compared to CubeSat satellites.

CRP has considerable experience supplying solutions for space key industry leaders



### LATEST IN ADDITIVE MANUFACTURING

Additive Manufacturing

Additive manufacturing of multiple metallic and hybrid components



May 20th, 2020

Additive Manufacturing

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David Belforte May 12th, 2020



Additive Manufacturing

Laser additive manufacturing works with aircraft-grade aluminum alloy

David Belforte May 8th, 2020



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Luxinar carbon dioxide lasers help in the fight against COVID-19

David Belforte Apr 17th, 2020



Additive Manufacturing

World's tallest laser-powder additive manufacturing system to service the oil field

David Belforte Apr 16th, 2020





## Manufacturing Tomorrow



### Fruitful use of professional 3D printing and composite material in the manufacture of Space qualified 6p PocketQube deployer

Visit <http://Crptechnology.com> for further information

*Alba Orbital turn to Italy-based CRP Technology for the creation of an innovative mothership. The result is AlbaPod 2.0, 3D printed deployer for the World's most advanced Picosatellites, realized in Windform® XT 2.0*

05/13/20, 05:33 AM | Additive & 3D Printing, Design & Development | CRP Technology

#### INTRODUCTION

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As tiny and reliable emerging satellites, PocketQubes are "an exemplar of New Space research and innovation."

The original idea came from Professor Robert J. Twigg from Morehead State University (MSU), who proposed the standard of "a satellite that fits in your pocket".

Indeed, a PocketQube is a type of miniaturized satellite for space research that usually has a size of 5 cm cubed (one eighth the volume of a CubeSat), has a mass of no more than 250 grams, and typically uses commercial off-the-shelf components for its electronics.

This type of satellite is quite young - started in 2009 - but their importance is increasing at warp speed, as a solution to the rising costs of CubeSat launches to low Earth orbit.

Since then, interest for PocketQubes has arisen from the Space industry. The first PocketQube Standard has been issued in June 2018, providing a shared platform to the PocketQubes community; one of the contributors (along with GAUSS Srl, TU Delft) is Alba Orbital, a fast growing high-tech SME based in Glasgow, Scotland. Alba Orbital provide a hub of support for the class of PocketQube satellites, by not only building their own platforms but providing parts and launch to companies, universities and space agencies around the world.

#### CHALLENGE

Recently Alba Orbital needed to build an updated version of their Pocketqube satellite deployer, AlbaPod 2.0.

The aims of the project were to improve on previous designs in terms of weight, manufacturability, access and incorporate a number of safety features.

Alba Orbital decided to turn to CRP Technology for the



TCT Mag



## Alba Orbital 3D prints Pocketqube satellite deployer with CRP Technology

BY LAURA GRIFFITHS 13 MAY 2020 11:56



3D printed AlbaPods 2.0 in Windform XT 2.0. (Credit: Alba Orbital)

Italian additive manufacturing specialist CRP Technology has been working with Glasgow-based Alba Orbital to build an updated deployer for PocketQube satellites.

These miniature 5cm, 250g satellites, derived from an idea from Professor Robert J. Twigg at Morehead State University (MSU) to build "a satellite that fits in your pocket", are designed to carry out space research with lower launch costs compared to CubeSat satellites.

Alba Orbital, which provides parts and launch to companies, universities and space agencies, teamed with CRP Technology to create a new version of its AlbaPod 2.0 satellite deployer with improved weight and manufacturability, and a number of safety features.

CRP Technology has been supplying its 3D printing expertise and materials to the space industry for some time with the majority of its Windform TOP-LINE composite materials approved for use by major launch providers following successful outgassing tests at NASA and ESA. For this project, they chose selective laser sintering in Windform XT 2.0 Carbon composite material, a non-outgassing, lightweight fibre reinforced polyamide plastic



## Portale Compositi



STAMPA 3D

### Stampa 3D e compositi per il lancio dei satelliti 'tascabili'

*CRP Technology ha assistito Alba Orbital nella scelta della migliore tecnologia di stampa 3D e materiale per la costruzione del sistema di rilascio AlbaPod 2.0, al fine di garantire il successo del progetto*

Tempo stimato  
di lettura 1,31 min



Si chiama PocketQube e rappresenta la nuova frontiera dei piccoli satelliti per la ricerca spaziale. L'idea originale del PocketQube è stata concepita dal professor Robert J. Twigg della Morehead State University (MSU), che ha proposto lo standard di "un satellite che può stare in tasca".



In effetti, un PocketQube è un tipo di satellite miniaturizzato di circa 5 centimetri cubo (un ottavo del volume di un CubeSat), e con una massa che non supera i 250 grammi.



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Il primo standard risale a giugno 2018, quando è stata rilasciata una piattaforma condivisa; tra i fautori di questa piattaforma (con GAUSS Srl e TU Delft) c'è Alba Orbital, una pmi high-tech con sede a Glasgow, Scozia.

Recentemente Alba Orbital ha deciso di realizzare una versione aggiornata (2.0 o v2) del suo dispositivo di lancio di PocketQube, chiamato AlbaPod, per ottenere miglioramenti in termini di peso, produttabilità, caratteristiche di sicurezza e accessibilità.



## Composites Portal



### Selective laser sintering process and composites for the PocketQubes

*Alba Orbital needed to build an updated version of their Pocketqube satellite deployer, AlbaPod 2.0, and decided to turn to CRP Technology for its manufacturing*

Estimated time of reading 1,26 min



As tiny and reliable emerging satellites, PocketQubes are "an exemplar of New Space research and innovation". The original idea came from Professor Robert J. Twiggs from Morehead State University (MSU), who proposed the standard of "a satellite that fits in your pocket".



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Recently Alba Orbital needed to build an updated version of their Pocketqube satellite deployer, AlbaPod 2.0, and decided to turn to CRP Technology, the Italian-based 3D printing company, for its manufacturing.

The work began with an accurate analysis of the 3D and 2D files and choosing the best technology and material to guarantee the success of the project: selective laser sintering process and Windform® XT 2.0 Carbon composite



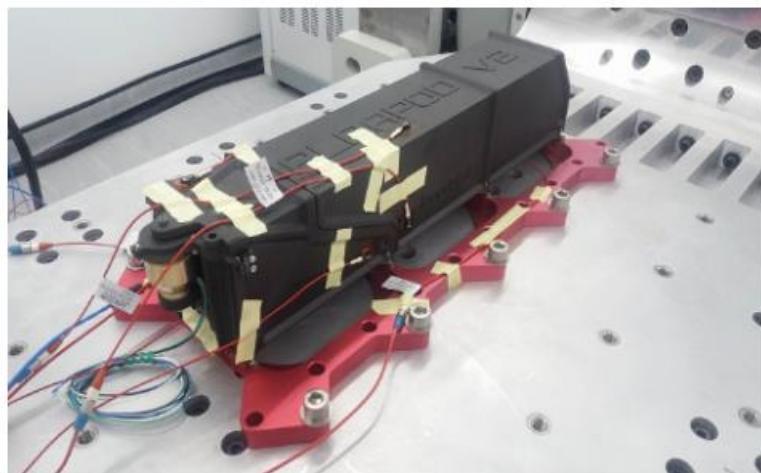
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## CRP Technology Makes 3D Printed PocketQube Satellite Deployer for Alba Orbital

May 14, 2020 • by Sarah Saunders • 3D Printing • Aerospace 3D Printing



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First there were the [smallsats](#), and the [CubeSats](#). Now there's something even smaller to launch into orbit – PocketQubes, a satellite with off-the-shelf electronic components that can fit into your pocket. One eighth the volume of a CubeSat, these tiny space research satellites are 5 cm cubed, with a mass of 250 grams, and while they were only conceived of about ten years ago, interest in them is growing quickly, as it's becoming more expensive to launch CubeSats into low Earth orbit.

Two years ago, the first PocketQube Standard was issued, and one of the contributors is Scottish high-tech SME [Alba Orbital](#). The company supports this satellite class, as it builds its own PocketQube platforms and provides global companies, space agencies, and universities parts and launches.

Alba Orbital needed to improve the access and manufacturability, and reduce the weight, of its PocketQube satellite deployer, the AlbaPod 2.0, along with adding some new safety features, and is partnering with [CRP Technology](#) on the project. The Italian 3D printing company has used its patented [Windform TOP-LINE](#) composite materials for aerospace applications in the past, so it was more than up to the task.





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PRESS RELEASES

## Fruitful use of laser sintering technology and composite material in the manufacture of Space qualified 6p PocketQube deployer

By Press Releases - May 15, 2020



Recently high-tech SME based in Glasgow (Scotland) Alba Orbital needed to build an updated version of their Pocketqube satellite deployer, AlbaPod 2.0.

The aims of the project were to improve on previous designs in terms of weight, manufacturability, access and incorporate a number of safety features.

Alba Orbital turn to CRP Technology for the manufacturing of the deployer, as the Italian-based 3D printing company has built a considerable experience supplying cutting-edge solutions for space key industry leaders using its patented Windform® TOP-LINE composite materials. Most of Windform® TOP-LINE composite materials are suitable for space applications and have passed outgassing tests at NASA and ESA.

Selective Laser Sintering process and Windform® XT 2.0 Carbon composite material have been chosen to guarantee the success of the project.

Alba Orbital team say, "as the product needed to withstand a launch to space while containing several satellites, the pod needed to withstand high vibrations, and in the worst scenario, contain any satellite that breaks free internally. Windform® XT 2.0's toughness and strength make it a perfect candidate for this use case."

CRP Technology manufactured in a short time AlbaPod v2, an extremely light weight flight proven 6P (Up to 6 satellites) 3D printed deployer for Pocketqube compatible satellites, with a mass of <500g (60% less than AlbaPod v1). "The most innovative aspect of the project – Alba Orbital comments - was the sheer number of components we switched over to Windform® XT 2.0, not only was the shell redesigned in the material, but also the moving ejection mechanism and door assembly. Additionally some parts are critically structural to the assembly as a whole." Alba Orbital team performed many tests on the 3D printed AlbaPod v2. On September 9th 2019 the first integration occurred. At the beginning of December 2019, Alba Orbital launched 6 PocketQube satellites into orbit via 3D printed AlbaPod v2 (mission: Alba Cluster 2). Alba Cluster 2 has been on orbit for 100 days. New launch with 3D printed AlbaPod v2 (Alba Cluster 3) is expected for later 2020. The experience in the manufacturing of AlbaPod v2, the technology and material used,



Industrie-Mag



ACTUALITÉ DES ENTREPRISES

## Avantageux emploi de l'impression 3D professionnelle et de matériau composite

Partagez sur

Publication: 29 mai

**Alba Orbital s'est adressée à CRP Technology pour la construction d'un système innovant de mise en orbite...**

Le résultat est AlbaPod 2.0, un déployeur de satellites entièrement réalisé par impression 3D professionnelle et avec Windform® XT 2.0 pour la mise en orbite des picosatellites les plus avancés du monde.



### Introduction

L'idée originale de PocketQube a été mise au point par **Robert J. Twigg**, professeur de la Morehead State University (MSU), qui a proposé un modèle de « satellite qui l'on peut mettre dans sa poche ».

En fait, un PocketQube est un type de satellite miniaturisé utilisé pour la recherche spatiale ayant des dimensions de l'ordre de 5 centimètres cubes (un huitième du volume d'un CubeSat) et dont le poids n'est pas supérieur à 250 grammes.

Il s'agit d'un type de satellites assez récents les premiers remontent à 2009 mais l'importance des PocketQube augmente très rapidement, comme solution alternative aux lancements de plus en plus coûteux de CubeSat dans l'orbite terrestre basse.

Le premier modèle a été mis au point au mois de juin 2018, lors de la délivrance d'une plate-forme partagée ; parmi les concepteurs de cette plate-forme (avec GAUSS Srl et TU Delft), il y a **Alba Orbital**, une PME de haute technologie en croissance rapide ayant son siège à Glasgow, en Écosse.

**Alba Orbital** fournit un centre de support pour les PocketQube non seulement en réalisant ses propres plates-formes, mais aussi en fournissant les composants et en aidant les entreprises, les universités et les agences spatiales à mettre en orbite les PocketQube de toutes les régions du monde.

### Défi

Récemment **Alba Orbital** a décidé de réaliser une version actualisée (2.0 ou v2) de son dispositif de lancement de PocketQube, appelé AlbaPod, pour obtenir des améliorations en termes de poids, possibilités de fabrication, caractéristiques de sécurité et accessibilité.



## GP One



### MotoGP vs Covid-19: riders, teams and sponsors unite in the fight

From Valentino Rossi to Marc Marquez, the MotoGP paddock pull together to try and do its part to fight Covid-19

Submitted by  
 GPOne  
on Tue, 12/05/2020 - 16:03

[MotoGP](#) [Covid-19](#) [Charity](#) [Valentino Rossi](#) [Marc Marquez](#) [Maverick Vinales](#) [Ducati](#) [Dorna](#) [Mugello](#)

[Motomondiale](#)



The parent company of FIM Enel MotoE World Cup bike manufacturer Energica – **CRP Technology** – is ensuring that some of the same expertise that has made the Energica Ego Corsa such an incredible success is now committed to fighting coronavirus. In house, the company are manufacturing several functional prototypes of emergency valves for reanimation devices, as well as link components for emergency respiratory masks for assisted ventilation, using additive manufacturing and their own patented Windform P1 isotropic material. The valves are currently being tested in a hospital in Lombardy, Italy.



## 3D Printing Creative



### PocketQube in orbita con la stampa 3D

27 Maggio 2020



PocketQube è la nuova frontiera dei piccoli satelliti per la ricerca spaziale. L'idea originale del PocketQube è stata concepita dal professor Robert J. Twiggs della Morehead State University (MSU), che ha proposto lo standard di "un satellite che può stare in tasca".

Un PocketQube è un tipo di satellite miniaturizzato di circa **cinque centimetri cubi** (un ottavo del volume di un CubeSat) e con una massa che non supera i 250 grammi.

Si tratta di una tipologia di satelliti giovani, i primi risalgono al 2009, ma l'importanza del PocketQube cresce a ritmi incessanti, come soluzione alternativa ai lanci sempre più costosi di CubeSat nell'orbita terrestre bassa.

Il primo standard risale a giugno 2018, quando è stata rilasciata una piattaforma condivisa; tra i fautori di questa piattaforma (con GAUSS Srl e TU Delft) c'è Alba Orbital, una PMI high-tech con sede a Glasgow, Scozia.

Alba Orbital è un centro di supporto per i PocketQube formato da giovani ingegneri e anche un costruttore di piattaforme di lancio per i PocketQube.

Aziende, università e agenzie spaziali di tutto il mondo si rivolgono ad Alba Orbital per lanciare nella bassa orbita terrestre i loro picosatelliti.

Recentemente Alba Orbital ha deciso di realizzare una versione aggiornata 2.0 del suo dispositivo di lancio di PocketQube, chiamato AlbaPod, per ottenere miglioramenti in termini di peso, produttabilità, caratteristiche di sicurezza e accessibilità.

Il team di Glasgow si è rivolto a Crp Technology per la costruzione del sistema di rilascio: l'azienda di Modena, che da decenni si occupa di stampa 3D professionale, ha maturato una notevole esperienza nel fornire soluzioni all'avanguardia ai maggiori player del settore spaziale utilizzando i materiali compositi e brevettati Windform® TOP-LINE. Infatti, la maggior parte dei Windform sono adatti per applicazioni spaziali funzionanti, avendo superato i test di outgas NASA ed ESA.

Ridurre il peso al minimo è un obiettivo fondamentale per qualsiasi componente aerospaziale; inoltre, il



## 3D Printing Industry



A thumbnail image of a news article from 3D Printing News Digest. The title reads: "3D PRINTING INDUSTRY NEWS SLICED: SATAIR, VELO3D, 3D SYSTEMS, DIMENSION INX, REGEMAT, OPEN ADDITIVE, DP TECHNOLOGY AND MORE". Below the title, it says "PAUL HANAPY - MAY 27TH 2020 - 8:30PM 0 0".

### Aerospace developments from Satair, Open Additive and CRP Technology

Italian-based 3D printing company [CRP Technology](#) has successfully 3D printed the second edition of the AlbaPod PocketQube mini-satellite for British aerospace company [Alba Orbital](#). The device, designed to be used for space research, was created using commercially available electronic components, and has a size of 5 cm cubed and a mass of no more than 250 grams. Using CRP's upgraded Windform XT 2.0 carbon composite materials and SLS 3D printing, the company was able to reduce the mass of a number of major components. The satellite is therefore 60% lighter than its predecessor, the AlbaPod v1. Six of the satellites were successfully launched into orbit in December 2019, and Alba Orbital plan to launch another cluster later in 2020.

"3D printing allows us to rapidly improve design and customise/create bespoke launchers in the future for demanding payloads which may fall outside the Pocketqube standards or require special considerations. It will also allow the fast integration of new release mechanisms allowing us to switch manufacturers comparatively quickly and easily if problems with supply chain arise," said the Alba Orbital team.





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Press release

## Fruitful use of 3D printing and composite material in the creation of Space qualified PocketQube deployer

05-28-2020 01:21 PM CET | Science & Education

Press release from: CRP Technology



3D printed AlbaPod 2.0 on Vibration table going through preflight certification. Courtesy Alba Orbital

outgassing tests at NASA and ESA.

Selective Laser Sintering process and Windform XT 2.0 Carbon composite material have been chosen to guarantee the success of the project.

Alba Orbital team say, "as the product needed to withstand a launch to space while containing several satellites, the pod needed to withstand high vibrations, and in the worst scenario, contain any satellite that breaks free internally. Windform XT 2.0's toughness and strength make it a perfect candidate for this use case."

CRP Technology manufactured in a short time AlbaPod v2, an extremely light weight flight proven 6P (Up to 6 satellites) 3D printed deployer for PocketQube compatible satellites, with a mass of

Veronica Negrelli  
CRP Technology Press Office Manager  
via Cesare Della Chiesa, 150/C  
41126 Modena  
ITALY

CRP Technology is headquartered in Modena, Italy. It is distinguished by its know-how in Selective Laser Sintering technology. It offers part production for short- and low-run production, and prototyping services with advanced 3D Printing and Additive Manufacturing solutions using Windform TOP-LINE range of high performance composite materials. As a material provider, CRP Technology develops, manufactures and sells to OEMs its proprietary Windform TOP-LINE composite materials for Laser Sintering technology. CRP Technology specific application fields including but are not limited to: automotive and motorsports, design, aerospace, UAVs, marine, entertainment, defense, and packaging.

*This release was published on openPR.*

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Recently high-tech SME based in Glasgow (Scotland) Alba Orbital needed to build an updated version of their Pocketqube satellite deployer, AlbaPod 2.0. The aims of the project were to improve on previous designs in terms of weight, manufacturability, access and incorporate a number of safety features. Alba Orbital turn to CRP Technology for the manufacturing of the deployer, as the Italian-based 3D printing company has built a considerable experience supplying cutting-edge solutions for space key industry leaders using its patented Windform TOP-LINE composite materials. Most of Windform TOP-LINE composite materials are suitable for space applications and have passed

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## Raumfahrer

[m.Raumfahrer.net](http://m.Raumfahrer.net)



Drei Freisetzungssysteme AlbaPod 2.0, hergestellt von CRP Technology im 3D-Druck mit Windform® XT 2.0.  
(Bild: Alba Orbital)

### Die Herausforderung

Vor Kurzem beschloss Alba Orbital, eine aktualisierte Version (2.0 oder v2) seines PocketQube-Freisetzungsgeräts, genannt AlbaPod, herzustellen, um Verbesserungen bei Gewicht, Produktionsmöglichkeiten, Sicherheitsmerkmalen und Zugänglichkeit zu erzielen.

Für die Konstruktion des Freisetzungssystems wandte sich das Team aus Glasgow an CRP Technology: Das in Modena ansässige Unternehmen, das sich seit Jahrzehnten mit professionellem 3D-Druck beschäftigt, kann auf eine beträchtliche Erfahrung bei der Bereitstellung von hochmodernen Lösungen für die wichtigsten Akteure im Raumfahrtsektor unter Verwendung der patentierten Verbundwerkstoffe Windform® TOP-LINE verweisen. Tatsächlich sind die meisten Windform®-Materialien für Anwendungen in der Raumfahrt geeignet, da sie die Ausgasungstests von NASA und ESA bestanden haben.

Die Reduzierung des Gewichts stellt für sämtliche Raumfahrkomponenten ein grundlegendes Planungsziel dar. Darüber hinaus muss das für die Herstellung gewählte Material aufgrund der strengen Ausgasungsanforderungen für den Flug zugelassen sein. Aus der Sicht von Alba Orbital war daher von Anfang an klar, dass die Verwendung eines bereits von den wichtigsten Stellen genehmigten Materials die Annahme des Freisetzungsprogramms durch alle beteiligten Parteien erleichtern würde.



AlbaPod 2.0 mit voller Besetzung - Abdeckung für Inspektion ausgebaut.  
(Bild: Alba Orbital)

### Die Lösung

Die Aufgabe war schwierig, aber dank der langjährigen Erfahrung auf dem Gebiet der additiven Fertigung zur Unterstützung der fortschrittlichsten Industriesektoren nahm CRP Technology die Herausforderung an.

Die Tätigkeit der 3D-Druckabteilung von CRP Technology konzentrierte sich von Anfang an auf die Optimierung und das Erreichen der geforderten Ziele, wobei eng mit dem Team von Alba Orbital zusammengearbeitet wurde.

30. Mai 2020, 10:32 Uhr

## Dispenser AlbaPod 2.0 in 3D-Druck

Erfolgreicher Einsatz von professionellem 3D-Druck und Verbundmaterial bei der Herstellung eines 6p PocketQube-Freisetzungssystems. Eine Pressemitteilung der CRP Technology.



Freisetzungssystem AlbaPod 2.0 während der Zertifizierung vor dem Flug.  
(Bild: Alba Orbital)

29. Mai 2020 - Alba Orbital wandte sich für die Konstruktion eines innovativen Systems für die Freisetzung in die Umlaufbahn an CRP Technology. Das Ergebnis ist AlbaPod 2.0, der vollständig im professionellen 3D-Druck und mit Windform® XT 2.0 hergestellte Deployer für die Freisetzung der weltweit modernsten Kleinsatelliten.

Die ursprüngliche Idee für den PocketQube stammt von Professor Robert J. Twigg von der Morehead State University (MSU), der den Standard eines „Satelliten, der in Ihre Tasche passt“ vorschlug.

In der Tat ist ein PocketQube eine Art Miniatursatellit, der in der Weltraumforschung eingesetzt wird, mit einer Größe von etwa 5 Kubikzentimetern (ein Achtel des Volumens eines CubeSat) und einem Gewicht von maximal 250 Gramm. Es handelt sich um eine eher neue Art von Satelliten - die ersten stammen aus dem Jahr 2009 - aber die Bedeutung von PocketQube als Alternative zu den immer teurer werdenden Freisetzungen von CubeSat in die erdnahe Umlaufbahn, nimmt unaufhaltsam zu.

Der erste Standard geht auf Juni 2018 zurück, als eine gemeinsame Plattform ins Leben gerufen wurde. Unter den Befürwortern dieser Plattform befand sich (mit GAUSS Srl und TU Delft) Alba Orbital, ein schnell wachsendes High-Tech-KMU mit Sitz in Glasgow, Schottland.

Alba Orbital stellt ein Supportzentrum für PocketQube zur Verfügung, und zwar nicht nur durch den Bau eigener Plattformen, sondern auch durch die Bereitstellung von Komponenten und die Unterstützung von Unternehmen, Universitäten und Raumfahrtbehörden aus der ganzen Welt bei der Freisetzung von PocketQubes in die Umlaufbahn.

Die Arbeit begann mit einer genauen Analyse der 2D- und 3D-Dateien. Dank seines in über 25 Jahren im Dienst der anspruchsvollsten Industriesektoren erworbenen Know-Hows konnte CRP Technology Alba Orbital bei der Wahl der besten 3D-Drucktechnologie und des besten Materials für die Herstellung des Freisetzungssystems AlbaPod 2.0 unterstützen, um den Erfolg des Projekts zu garantieren.

Das Team von Alba Orbital entschied sich für das selektive Lasersintern und den Werkstoff Windform® XT 2.0 aus der Produktreihe Windform® TOP-LINE. „AlbaPod v2“, so die Ingenieure von Alba Orbital, „muss eine Freisetzung in den Weltraum überstehen und in seinem Inneren zahlreiche Satelliten beherbergen. Die Beständigkeit gegen hohe Schwingungen war schon immer eine wesentliche Anforderung, so wie die Sicherheit des PocketQube vor der Freisetzung. Die Steifigkeit und Robustheit machten Windform® XT 2.0 zu einem perfekten Kandidaten für diesen Einsatz.“



**Press Office Manager**  
**Veronica Negrelli**  
[www.crp-group.com](http://www.crp-group.com) – [www.winform.com](http://www.winform.com)

**June 2020**

Tecn'è LAB

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## L'esperienza nella stampa 3D di CRP Technology al servizio della ricerca spaziale

01/06/2020 332 volta/e



Condividi Articolo



Il sistema di rilascio AlbaPod 2.0 realizzato da CRP Technology in stampa 3D e Windform® XT 2.0 durante la certificazione prevolo. (Foto: su gentile concessione di Alba Orbital)

Alba Orbital si è rivolta a CRP Technology per la costruzione di un innovativo sistema di rilascio in orbita. Il risultato è AlbaPod 2.0, il deployer costruito in stampa 3D e Windform® XT 2.0 per il rilascio dei picosatelliti più avanzati al mondo.

di Carlo Martelli

Si chiama PocketQube e rappresenta la nuova frontiera dei piccoli satelliti per la ricerca spaziale. L'idea è stata concepita dal Professor Robert J. Twigg della Morehead State University (MSU), che ha proposto lo standard di "un satellite tascabile". In effetti, un PocketQube è un tipo di satellite miniaturizzato di circa 5 cm<sup>3</sup> (un ottavo del volume di un CubeSat), e con una massa che non supera i 250 g. Si tratta di una tipologia di satelliti alquanto giovane – i primi risalgono al 2009 –, ma l'importanza del PocketQube cresce a ritmi incessanti come soluzione alternativa ai lanci sempre più costosi di CubeSat nell'orbita terrestre bassa.

Il primo standard risale a giugno 2018, quando è stata rilasciata una piattaforma condivisa. Tra i fautori di questa piattaforma (con Gauss s.r.l. e TU Delft) c'era Alba Orbital, una PMI high-tech con sede a Glasgow, in Scozia. Alba Orbital non è solo un centro di supporto per i PocketQube formato da giovanissimi ingegneri, ma anche un costruttore di piattaforme di lancio per i minisatelliti. Aziende, università e agenzie spaziali di tutto il mondo si rivolgono ad Alba Orbital per lanciare nella bassa orbita terrestre i loro avanzati picosatelliti.



## K ZEITUNG



Home / Themen: 3D-Druck / 3D-gedruckte CFK-Strukturen im Weltraum bewährt

### 3D-gedruckte CFK-Strukturen im Weltraum bewährt

← Back to Beiträge



02

3D-Druck 3D-Drucker, Additive Fertigung, CFK

Jun

3D-Druck mit selektivem Lasersintern von kohlefaser verstärkten Verbundmaterial hat die schwierige Bewährungsprobe im Weltraum erfolgreich bestanden.

Ein vollständig mit professionellem 3D-Druck aus CFK-Verbundmaterial hergestellter „Deployer“ hat einige der weltweit modernsten Kleinsatelliten erfolgreich in den Weltraum entlassen. Das innovative System für die Freisetzung der Pocket-Qube Satelliten, den Alba-Pod 2.0, hat CRP Technology im Auftrag von Alba Orbital konstruiert und mit Windform XT 2.0 mit 3D-Druck hergestellt.

#### Weltraumforschung mit Mikrosatelliten nimmt zu

Pocket-Qubes sind Miniatsatelliten, die in der Weltraumforschung eingesetzt werden. Die winzigen Satelliten sind in der Größe genormt und jeweils 50 mm breit und hoch. Die Länge kann 50, 114 oder 178 mm betragen. Die je nach Größe maximal 250, 500 oder 750 g schweren Satelliten gelten als Alternative zu den immer teurer werdenden Freisetzungen der bis zu achtmal größeren Cube-Sat-Satelliten.

Alba Orbital, ein schnell wachsendes High-Tech-KMU mit Sitz im schottischen Glasgow, hat sich auf kostengünstige Raumfahrt mit Pocket-Qubes spezialisiert und stellt ein Supportzentrum für Pocket-Qubes zur Verfügung, deren Bedeutung für die erdnahe Umlaufbahn unaufhaltsam zunimmt. Das Supportzentrum dient nicht nur dem Bau eigener Plattformen, sondern der Bereitstellung von Komponenten und Unterstützung von Unternehmen, Universitäten und Raumfahrtbehörden aus der ganzen Welt bei der Freisetzung von Pocket-Qubes in die Umlaufbahn.

Mit 3D-Druck leichter, sicherer und besser zugänglich



## Meccanica Plus



[Home](#) > [Focus on](#) > Cell-holder in AM by CRP Technology for electric motorcycles

# Cell-holder in AM by CRP Technology for electric motorcycles

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Posted 15 June 2020

The Italian [CRP Technology](#) has produced with 3D printing a cell pouch frame for [Energica Motor Company](#), to test on electric vehicles battery pack prototypes both for racing and production series.

Both born from the entrepreneurial vision of [Cevolini family](#), the two companies started collaborating since the foundation of Energica, which is closely involved in the [MotoE racing series](#) and is the only firm in the world to have an exclusive testing ground to try new challenging technical solutions, for some of the best riders worldwide. Energica supersport electric motorcycles use a high-energy lithium polymer (Li-NMC) battery. The battery is contained in a [sealed housing](#), with battery cells, the battery management system (BMS) and all the necessary systems to ensure the safety of the vehicle.

The company asked CRP Technology to develop a special cell frame to test a battery pack prototype on the road, and the casing of each pouch cell had to be manufactured using a [high-performance material](#), ensuring [excellent mechanical properties](#) and using advanced technology to meet Energica's requirements. In order to carry out the tests, the team of engineers at Energica decided to provide [each pouch cell with a surrounding case](#), with the function of support and reinforcement.



Following the examination of Energica's needs and the analysis of the 3D files of the application, CRP Technology has opted to use [selective laser sintering](#) technology with [Windform FR2](#), the new material from Windform TOP-Line family of high performance composite material for additive manufacturing, which is [flame retardant](#) and [glass-fiber reinforced](#). The polyamide-based material, electrically insulated, stiff, resistant to temperature and flame retardant, has fully satisfied all the functional requirements of the pouch cells casing. In particular, Windform FR2



## Automotive Interiors World

# AUTOMOTIVE INTERIORS WORLD



### Additive manufacturing aids airbag housing development

0

BY LAWRENCE BUTCHER ON JUNE 16, 2020

SAFETY

Safety critical components must be subject to rigorous test programs that replicate real-world conditions as closely as possible. Therefore, when US airbag and safety system manufacturer Joyson Safety Systems started a project to explore the potential for additive manufacturing (AM) in the production of airbag housings for prototype testing, it needed to know any AM part matched the performance of its production counterpart.

Additive manufacturing offered the potential to produce a functional prototype housing within days instead of months, out of composite materials with similar mechanical, thermal properties and performance to the original materials. Provided the right material properties could be achieved, significant time and cost savings could be achieved by removing the need for high cost tooling for injection molding.

The first stage of Joyson Safety Systems' research was to carry out a market analysis in order to find a composite material corresponding to the existing material (in this case, polyamide with 40% glass fiber reinforcement) used in the production of the airbag housing container through conventional injection molding processes.

A driver airbag (DAB) housing is normally produced with PA6-GF40 material. The complete airbag system consists of an



The Fabricator / The Additive Report

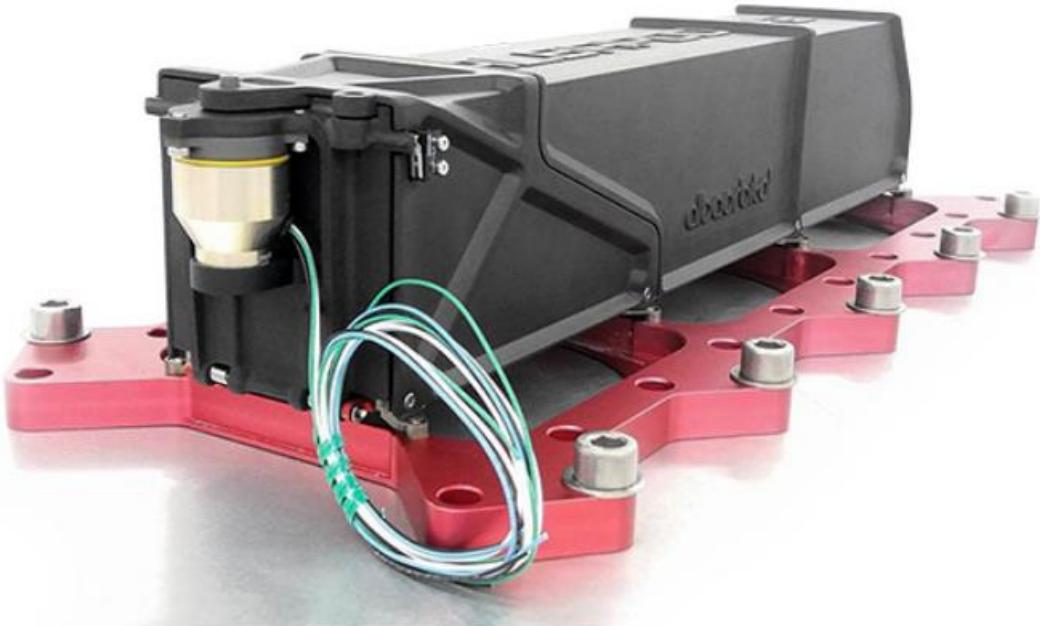


## Shop 3D-prints diverse range of devices

CRP Technology's sample book of 3D printing jobs showcases AM's versatility



By Don Nelson | June 18, 2020 | Article | Additive Manufacturing | Join Discussion



CRP Technology 3D-printed a deployer for PocketQube miniature satellites, which measure 5 centimeters cubed and weigh less than 250 grams. *Alba Orbital*

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If you like stories about 3D-printing parts from polyimide-based materials—and who doesn't?—then you'll probably enjoy reading case studies posted to the [CRP Technology website](#).

Many of the parts and devices the Italian 3D printing company builds are interesting and illustrate additive manufacturing's versatility. A recent job was 3D-printing deployers for [Alba Orbital](#)'s PocketQube miniature satellites, which measure 5 centimeters cubed and weigh less than 250 grams.

Other examples of CRP Tech's work range from column capitals to custom face masks to motorcycle brake arms to futuristic tennis rackets to drones.

The latest case study is about prototyping a driver airbag (DAB) housing. CRP Tech used a selective laser sintering (SLS) printer to build housing from its Windform SP carbon-reinforced composite.



## 3D Printing Industry



The screenshot shows a news article from the 3D Printing Industry website. The headline reads: "FUNCTIONAL AIRBAG HOUSING CONTAINER PRODUCED VIA 3D PRINTING WITH CRP TECHNOLOGY". The article is categorized under "AUTOMOTIVE". Below the headline, it says "ANAS ESSOP - JUNE 15TH 2020 - 5:30PM". There are social media sharing icons at the bottom left and a dark background image of a car's interior at the bottom.



Joyson Safety Systems (JSS), a Michigan-headquartered mobility safety specialist, has used SLS 3D printing with [CRP Technology's](#) carbon reinforced composite material Windform SP to manufacture a functional airbag housing container prototype.

Looking to explore the potential of additive manufacturing in its production processes, the JSS Core innovations team sought to manufacture a functional Driver Airbag (DAB) housing part prototype in a matter of days, instead of months. It was important for JSS that the prototype was made out of composite materials which were almost similar in mechanical, thermal properties and performance to the original DAB housing materials, and thus opted to use the Windform SP carbon reinforced composite material.

"After running some market analysis in order to find out the most suitable material and process that could deliver the required performance, we came across the Windform TOP-LINE family of composite material and, specifically, the Windform SP," comments Samer Ziadeh and Daniel Alt from JSS' Core innovations team.

"WINDFORM SP BROUGHT OUR ATTENTION TO THE FACT THAT IT'S A MATERIAL PRODUCED FROM



The Market for Metal Additive Manufacturing Services: 2020-2029  
[LEARN MORE](#)

The advertisement for Windform features the "WINDFORM FOR ADVANCED 3D PRINTING" logo at the top. It shows a comparison between a physical 3D printed DAB housing part and a pile of dark grey Windform SP powder. Below the images, the text "Functional 3D Printed DAB housing" is displayed, followed by a "READ THE CASE STUDY" button.

The advertisement for the "FREE BEGINNER'S GUIDE TO 3D PRINTING" features the title prominently in large, bold, white letters against a dark, textured background.



Progettare

# www.meccanica-plus.it progettare

ADDITIVE MANUFACTURING



La stampa 3D è con successo utilizzata nello sviluppo di veicoli elettrici. Di seguito illustriamo la realizzazione da parte di CRP Technology di porta-celle per test su pacchi batteria prototipali delle moto Energica, sia da gara sia da strada, utilizzando la tecnologia della sinterizzazione laser selettiva e il materiale composito caricato fibra di vetro e ritardante di fiamma

WindformFR2

## Stampa 3D per veicoli elettrici

Primo costruttore di moto elettriche supersportive Made in Italy, Energica Motor Company è un importante protagonista nel mercato dei veicoli elettrici. Con la designazione a costruttore unico per la coppa del mondo dedicata a

moto elettriche, la cui prima edizione si è conclusa poco tempo fa con l'incoronazione di Matteo Ferrari (team Gresini) sul gradino più alto del podio, lo sviluppo tecnologico di Energica ha avuto una importante accelerazione, potendo contare su un elemento

di competitività unico rappresentato dalla stessa MotoE: Energica è infatti l'unica azienda al mondo ad avere un banco di prova esclusivo per testare nuove soluzioni tecniche con i migliori piloti al mondo. Un supporto che si è rivelato senza precedenti per il



## Morgen Filament



Joyson Safety Systems, a leading provider of mobility safety components, systems and technology, recently developed its first functional 3D printed prototype of a Driver Air Bag (DAB) housing, using selective laser sintering (SLS) and Windform composite material from CRP Technology.



*Image courtesy CRP Technology*

Joyson Safety Systems already has a history of pioneering innovation in mobility safety solutions, such as airbags, seatbelts, safety electronics and more, for automotive and non-automotive markets. Worth noting is the fact that it was the first manufacturer to supply leading OEMs in North America and Europe with steering wheels with Hands on Detection (HOD) for autonomous driving. In this instance, the company's Core Innovations team looked to quickly develop prototypes for its airbag housing and turned to additive manufacturing to explore new processes and materials.

Traditionally, the airbag housing is produced using injection molding made up of a material that is polyamide with 40% glass fiber reinforcement, PA6-GF40. The DAB system, which needs to deploy in just 30-50 milliseconds to prevent injury to the driver, consists of the inflator, airbag cushion, cover and housing attached to the steering wheel. The performance of this system is essential, as a critical safety component of the vehicle that needs to have enough strength, impact resistance, and stability under heat and other diverse environmental conditions. Samer Ziadeh and Daniel Alt from the Core Innovations team explain the requirements for the DAB,

*'It is to withstand a high amount of dynamic loads in addition to holding the inflator and the airbag cushion fixed in location during and after the deployment of the airbag system. This load is developed due to the pressure required to inflate the airbag, as a result the large stresses will directly be applied on the airbag system and more particularly on the DAB housing. The test procedures are normally conducted within a various range of temperatures between -35°C and 85°C.'*



## Stampare in 3D



# STAMPARE IN 3D

LE ULTIME NOVITÀ DAL MONDO DELLA STAMPA 3D

## Stampa in 3d di un alloggiamento per airbag



POSTED BY: MARGIOV MARGIOV GIUGNO 15, 2020

CONTENITORE FUNZIONALE PER AIRBAG PRODOTTO TRAMITE STAMPA 3D CON TECNOLOGIA CRP

Joyson Safety Systems (JSS), uno specialista della sicurezza della mobilità con sede nel Michigan, ha utilizzato la stampa 3D SLS con il materiale composito rinforzato con carbonio Windform SP della tecnologia CRP per produrre un prototipo funzionale di contenitore per alloggiamento airbag.

Cercando di esplorare il potenziale della produzione additiva nei suoi processi di produzione, il team di innovazioni di JSS Core ha cercato di produrre un prototipo funzionale di Airbag per conducente (DAB) in pochi giorni, anziché mesi. Per JSS era importante che il prototipo fosse realizzato con materiali compositi che erano quasi simili nelle proprietà meccaniche, termiche e nelle prestazioni ai materiali di alloggiamento DAB originali, e quindi optò per l'uso del materiale composito rinforzato con carbonio Windform SP.

“Dopo aver eseguito alcune analisi di mercato al fine di scoprire il materiale e il processo più adatti in grado di fornire le prestazioni richieste, ci siamo imbattuti nella famiglia di materiali compositi TOP-LINE di Windform e, nello specifico, in Windform SP”, commenta Samer Ziadeh e Daniel Alt dal team di innovazioni Core di JSS.

“WINDFORM SP HA ATTIRATO LA NOSTRA ATTENZIONE SUL FATTO CHE È UN MATERIALE PRODOTTO CON POLIAMMIDE PA E RINFORZATO CON FIBRA DI CARBONIO COME MATERIALE IN POLVERE, E HA QUASI LE PRESTAZIONI RICHIESTE E PERSINO MIGLIORI PER LA NOSTRA



## Composites Portal

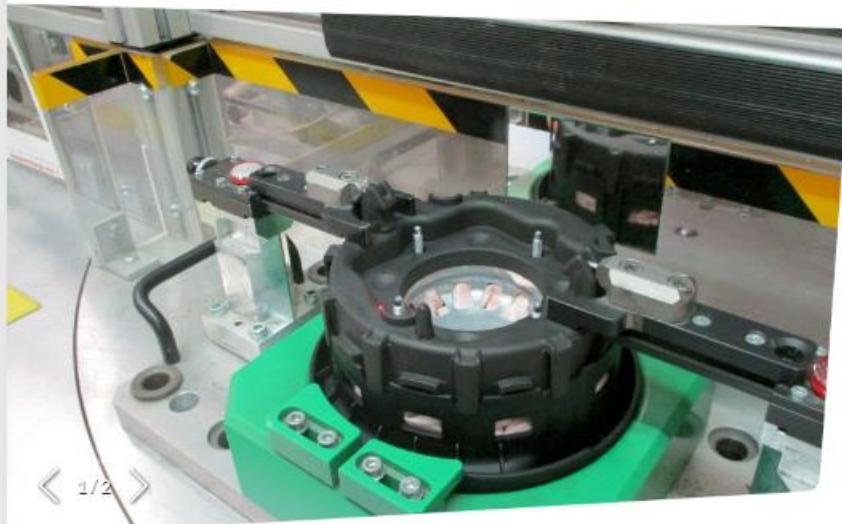


3D PRINTING SOLUTIONS

### The 3D printing technology for the airbag housing container

*Thanks to the collaboration with CRP Technology, it was possible for Joyson Safety Systems to produce a functional prototype.*

Estimated time of reading 1 min



Joyson Safety Systems, a global leader in mobility safety, started a project to explore and deep dive into the additive manufacturing field, also pointing out to its possibilities and potentials to discover new processes and materials to use for the manufacturing of airbag housing container, and turns to CRP Technology for its Windform® TOP-LINE range of high performance materials and its in-house 3D printing service.



Thanks to the collaboration with CRP Technology and to the use of Windform® SP Carbon composite material, it was possible to produce a functional prototype and to test it in a complete airbag module within a short period.



The test has led to very good results as the material exhibits an excellent mechanical performance in terms of high strength and impact resistance as well a good thermal stability between a low and high range of temperatures (RT; 23°C, -35°C & 85°C).

The most innovative aspect about Joyson Safety Systems project and application is the fact that this is the first functional prototype of a DAB housing to be produced with SLS process using a composite material,



## Portale Compositi

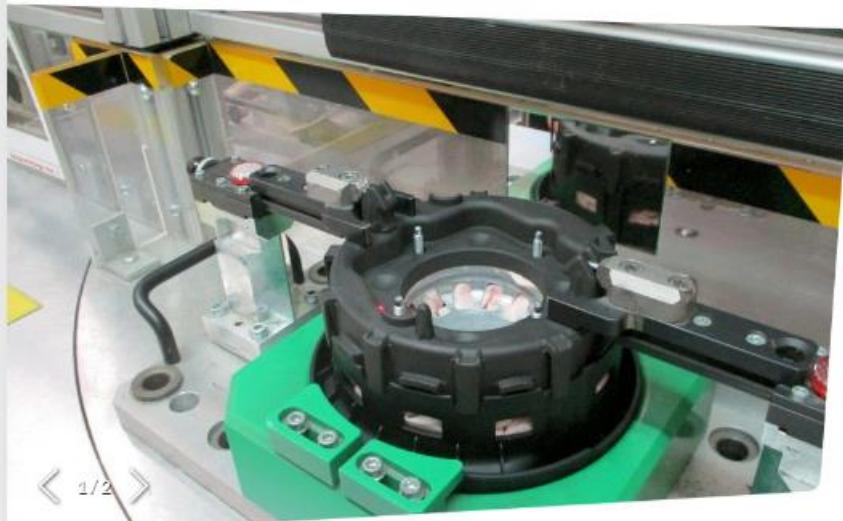


STAMPA 3D

### La stampa 3D aiuta a realizzare supporti per airbag

Gli ingegneri del Centro Innovazioni Joyson Safety Systems si sono rivolti a CRP Technology e al suo servizio interno di stampa 3D, che ha realizzato il prototipo

Tempo stimato di lettura 1.03 min



Il Centro Innovazioni della Joyson Safety Systems, azienda leader nel campo della sicurezza su strada, ha recentemente condotto un progetto per esplorare e approfondire il campo della produzione additiva, nell'ottica di scoprire nuovi processi e materiali da utilizzare nella produzione di supporti per airbag (Airbag housing container) e, nello specifico, per l'airbag frontale del conducente (Driver Airbag o DAB).



Gli ingegneri del Centro Innovazioni Joyson Safety Systems si sono rivolti a CRP Technology e al suo servizio interno di stampa 3D, che ha realizzato il prototipo funzionale del supporto per airbag.



Grazie alla tecnologia utilizzata (sinterizzazione laser selettiva) e al materiale composito caricato fibra di carbonio Windform® SP, la Joyson Safety Systems ha ricevuto in breve tempo il particolare richiesto, potendo così completare lo studio ed evidenziando risultati molto buoni: infatti "il materiale usato per la costruzione del prototipo funzionale ha mostrato eccellenti prestazioni meccaniche in termini di elevata robustezza e resistenza agli urti, nonché una buona stabilità termica, riscontrata in una gamma di temperature variabili: 23°C, -35°C e 85°C.

L'aspetto più innovativo risiede nel fatto che è il primo prototipo funzionale di



A3Dm – magazine

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Accueil > News > Secteurs > Toutes industries > Impression 3D d'un déployeur de satellites

News

Vendredi 5 juin 2020 - 12:47

## Impression 3D d'un déployeur de satellites

[Toutes industries](#)



Kevin Crespin

Rédacteur Web

Partagez cette news :



La société écossaise Alba Orbital, constructeur de satellites, a fait appel à la société italienne CRP Technology pour la construction d'AlbaPod 2.0, un déployeur de satellites entièrement réalisé par impression 3D. La technologie de fusion laser sur lit de poudre et le matériau Windform XT 2.0 ont permis de concevoir ces pièces.

### Un satellite miniaturisé utilisé pour la recherche spatiale

En juin 2018, la société Alba Orbital a participé (avec GAUSS Srl et TU Delft) au développement du premier modèle de satellite PocketQube, utilisé pour la recherche spatiale. Ce dernier a été mis au point par le professeur Robert J. Twigg de la Morehead State University (MSU), aux États-Unis. Il s'agit d'un modèle miniature de satellite « que l'on peut mettre dans sa poche », explique le professeur. Ce satellite ne mesure que 5 centimètres cubes pour 250 grammes. Alba Orbital a fourni une aide de support pour les PocketQube non seulement en réalisant ses propres platesformes, mais aussi en fournissant les



A3Dm – magazine

# A3Dm

Accueil > News > Secteurs > Toutes industries > L'hebdo de la fabrication additive #45

News

Lundi 8 juin 2020 - 17:22

## L'hebdo de la fabrication additive #45

[Toutes industries](#)

Temps de lecture estimé : 4 min



Kevin Crespin

Rédacteur Web

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[Découvrez le déployeur de satellites de la société Alba Orbital](#)





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Pressemeldung

## Herstellung der Halterung für Airbag-Systeme mit Hilfe des professionellen 3D-Drucks und Verbundmaterial

10.06.2020 - 14:52 | Wissenschaft, Forschung, Bildung auf openPR.de

Pressemeldung von: CRP Technology



Halterung des Fahrer-Frontairbags, hergestellt von CRP Technology im 3D-Druck mit Windform® SP

Das von Joyson Safety Systems, entwickelte Projekt ist das erste passive Sicherheitssystem für Nutzfahrzeuge, das mit der additiven Fertigung realisiert wurde. Es wurde von CRP Technology mittels selektiver Lasersintertechnologie und unter Verwendung des kohlefaserverstärkten Materials Windform® SP hergestellt.

### EINLEITUNG

Joyson Safety Systems (mit Hauptsitz in Auburn Hills, Michigan, USA) ist das führende Unternehmen im Bereich der Verkehrssicherheit, das fortschrittliche aktive und

passive Sicherheitssysteme/-vorrichtungen (darunter Sicherheitsgurte, Airbags, Kindersitze) herstellt und an die wichtigsten Erstausrüster auf dem Markt vertreibt.

Joyson Safety Systems ist auch der weltweit erste Hersteller von Lenkrädern mit HOD-Funktion („Handerkennung“) für autonomes Fahren.



### DIE HERAUSFORDERUNG

Das Innovationszentrum von Joyson Safety Systems hat vor kurzem ein Projekt zur Untersuchung und eingehenden Analyse des Bereichs der additiven Fertigung gestartet, um neue Verfahren und Materialien für die Herstellung von Airbag-Gehäusen (airbag housing container) zu entdecken.

Das Expertenteam führte eine Marktanalyse durch, um einen Verbundwerkstoff zu finden, der jenem Material entspricht, das bei der Herstellung des Teils mit dem herkömmlichen Verfahren (d.h. Spritzguss; und als Material zu 40 % glasfaserverstärktes Polyamid) verwendet wird.

Die Halterung des Fahrer-Frontairbags (Driver Airbag - DAB- housing) besteht in der Regel aus einem Polymer (Nylon 6), das zu 40 % glasfaserverstärkt ist (PA6-GF40).

Das Airbagssystem besteht aus dem Gasgenerator (Inflator), dem aufblasbaren Kissen, der Abdeckung und der Halterung mit den Befestigungspunkten am Lenkrad. Das Kissen befindet sich zwischen der Halterung und der Abdeckung.

Die korrekte Funktion der Halterung des Fahrer-Airbags ist von wesentlicher Bedeutung, da es sich um eine Sicherheitsvorrichtung im Fahrzeug handelt. Ihre Funktion besteht darin, zu verhindern, dass bestimmte Körperteile wie Kopf und Gesicht bei einem Unfall mit dem Lenkrad oder dem Armaturenbrett in Berührung kommen. Bei einem Aufprall bläst sich das Airbagkissen mit einer Geschwindigkeit von ca. 30-50 ms (Millisekunden) auf, um Verletzungen des Fahrers zu verhindern.

Die Halterung des Fahrerairbags hält die gesamte passive Sicherheitseinrichtung an ihrem Platz, wodurch sie zu einem unverzichtbaren Bestandteil des gesamten Systems wird.

Samer Ziadeh und Daniel Alt vom Joyson Safety Systems Innovation Center liefern weitere Details und erklären, dass die Funktion der Halterung des Airbagssystems darin besteht, „einer großen Menge an dynamischen Belastungen standzuhalten und zusätzlich den Gasgenerator und das aufblasbare Kissen während und nach der Entfaltung des Airbagmoduls an Ort und Stelle zu halten. Diese Belastung entsteht durch den Druck, der zum Aufblasen des Airbags erforderlich ist, weshalb bei den Tests hohe Spannungen direkt auf das Airbagssystem und insbesondere auf die Airbaghalterung ausgeübt werden.“

„Außerdem“, fahren Ziadeh und Alt fort, „werden die Tests normalerweise in einem Temperaturbereich zwischen -35 °C und 85 °C durchgeführt.“

Daher muss das für die Herstellung der Halterung des Airbagssystems verwendete Material eine angemessene Belastbarkeit, Stoßfestigkeit und thermische Stabilität aufweisen, um unter verschiedenen Prüfbedingungen ordnungsgemäß zu funktionieren.

### DIE LÖSUNG

Im Hinblick auf das Projekt zur Untersuchung und eingehenden Analyse des Bereichs der additiven Fertigung hat das Team des Innovationszentrums von Joyson Safety Systems ein sehr strenges Programm festgelegt, das auf die Erreichung spezifischer Ziele ausgerichtet ist, wie z.B.: Herstellung eines funktionalen Prototypen durch additive Fertigung in wenigen Tagen statt in Monaten, wodurch Zeit- und Geldverluste vermieden werden; Verwendung von Verbundwerkstoffen mit mechanischen, thermischen und Leistungseigenschaften, die jenen der Materialien, die bei dem „herkömmlichen“ Produktionsprozess eingesetzt werden, ähnlich sind; Überprüfung der Leistung des Bauteils mit echten Testsystemen, wobei das Bauteil Temperaturänderungen und hohen mechanischen



## AM Chronicle



# Successful use of 3D printing in the manufacturing of airbag housing container

🕒 3 weeks ago • 19 Views • 2 Min Read



As Joyson Safety Systems project and application, it is the first functional prototype to be produced with Laser Sintering process by using CRP Technology's Carbon reinforced composite material Windform® SP



Aditya  
Chandavarkar



Aditya  
Chandavarkar



Share This!

Joyson Safety Systems' Core innovations team started a project to explore and deep dive into the Additive Manufacturing field, also pointing out to its possibilities and potentials to discover new processes and materials to use for the manufacturing of airbag housing container.

The performance of the DAB housing part is extremely essential, due to the fact that it's a safety component in the vehicle.

The Joyson Safety Systems' Core innovations team explains, "after running some market analysis in order to find out the most suitable material and process that could deliver the required performance, we came across the CRP Technology's Windform® TOP-LINE family of composite material and, specifically, the Windform® SP.

Windform® SP brought our attention to the fact that it's a material produced from polyamide PA grades and reinforced with Carbon fiber as a powder form material, and it has almost the required and even better performance for our application."

Thanks to the collaboration with CRP Technology and to the use of Laser Sintering manufacturing process and Windform® SP Carbon composite material, it was possible to produce a functional prototype and to test it in a complete airbag module within a short period.

The test has led to very good results as the material exhibits an excellent mechanical performance in terms of high strength and impact resistance as well a good thermal stability between a low and high range of temperatures (RT; 23°C, -35°C & 85°C).

The most innovative aspect about Joyson Safety Systems project and application is the fact that this is the first functional prototype of a DAB housing to be produced with SLS process using a composite



## Il Progettista industriale

# "progettista" Industriale

Home > Attualità > La stampa 3D è utile per i supporti degli airbag

## La stampa 3D è utile per i supporti degli airbag

Riccardo Fioretto 10/06/2020

*Costruzione del supporto per sistemi airbag attraverso la stampa 3D professionale e materiale composito. Progetto a firma Joyson Safety Systems, è il primo prototipo funzionale realizzato in fabbricazione additiva e materiale composito caricato fibra di carbonio. È stato costruito da CRP Technology utilizzando la tecnologia della sinterizzazione laser selettiva e il caricato carbonio Windform SP.*

**Joyson Safety Systems** (sede centrale a Auburn Hills, Michigan, USA) azienda specializzata nel campo della sicurezza su strada, produce e distribuisce ai maggiori OEM del mercato sistemi/dispositivi avanzati di sicurezza, sia attivi che passivi (tra questi ultimi, basti citare cinture di sicurezza, airbag, seggiolini). Joyson Safety Systems è inoltre il primo produttore al mondo di volanti con funzione HOD ("Hands-on-Detection") per la guida autonoma.

### La sfida

Il Centro Innovazioni della Joyson Safety Systems ha recentemente condotto un progetto per esplorare e approfondire il campo della produzione additiva, nell'ottica di scoprire nuovi processi e materiali da utilizzare nella produzione di supporti per airbag

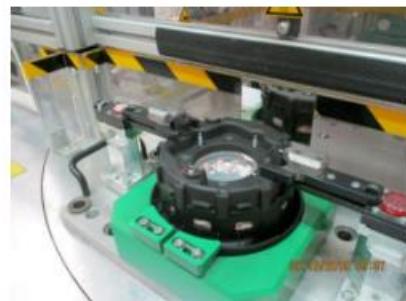


*Supporto dell'airbag frontale del conducente realizzato da CRP Technology in stampa 3D e Windform SP, vista interna*



*Supporto dell'airbag frontale del conducente realizzato da CRP Technology in stampa 3D e Windform SP*

(*Airbag housing container*) e, nello specifico, per l'airbag frontale del conducente (*Driver Airbag o DAB*). Il team di esperti ha così effettuato un'analisi di mercato al fine di individuare un materiale composito che corrispondesse al materiale utilizzato nella produzione del pezzo tramite processo convenzionale (ovvero stampaggio ad iniezione e come materiale, poliammide rinforzato con fibra di vetro al 40%). Il corretto funzionamento del supporto dell'airbag del conducente è fondamentale. In caso di urto il cuscino



*Assemblaggio dell'intero modulo airbag con la parte realizzata in stampa 3D e nel materiale composito Windform SP. Courtesy Joyson Safety Systems*



Click the gear



#### Additive

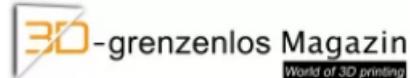
#### La stampa 3D è utile per i supporti degli airbag

Costruzione del supporto per sistemi airbag attraverso la stampa 3D professionale e materiale composito. Progetto a firma Joyson Safety Systems, è il primo prototipo funzionale realizzato in fabbricazione additiva e materiale composito caricato fibra di carbonio. È stato costruito da CRP Technology utilizzando la tecnologia della sinterizzazione laser selettiva e il caricato carbonio Windform SP. [...]

[Continua a leggere...](#)



## 3D-grenzenlos Magazin



Windform® XT 2.0:

### Alba Orbital entwickelt PocketQube-Satellit „AlbaPod 2.0“ mit 3D-Druck

2. Juni 2020 • Remziye Komur □ 3D-Objekte

PocketQubes sind eine kleinere Alternative zu den Kleinsatelliten CubeSats. Das Unternehmen Alba Orbital hat zusammen mit dem 3D-Druckunternehmen CRP Technology den 3D-gedruckten Deployer AlbaPod 2.0, der Ende 2020 freigesetzt werden soll, entwickelt.

CubeSats sind kostengünstige Kleinsatelliten, die bereits seit 1999 im Einsatz sind. Erst am 5. Mai 2020 startete eine Long March-5B-Trägerrakete mit einem „Weltraum-3D-Drucker“ und einem 3D-gedruckten CubeSat-Deployer in den Orbit. Da deren Freisetzung immer teurer wird, wurden PocketQubes entwickelt, die mit 5 Kubikzentimetern lediglich 1/8 der Größe eines CubeSats besitzen. Solch ein Miniatursatellit passt quasi in die Hosentasche.

Alba Orbital, ein britischer Hersteller derartiger PocketQubes, plante eine verbesserte Version seines Modells „AlbaPods“ und wandte sich mit diesem Vorhaben an das italienische 3D-Druckunternehmen CRP Technology, wie CRP Technology das 3D-grenzenlos Magazin in einer Pressemeldung wissen ließ.



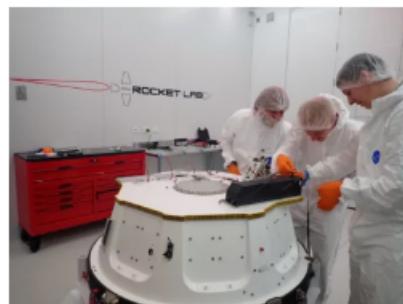
#### PocketQubes von Alba Orbital

2018 hat Alba Orbital eine Plattform ins Leben gerufen, bei der das Unternehmen für eigene PocketQubes sorgte, Komponenten bereitstellte und Unternehmen und Raumfahrtbehörden aus der ganzen Welt bei der Freisetzung der PocketQubes in die Umlaufbahn unterstützte. Jetzt sollte der AlbaPod in Gewicht, Produktionsmöglichkeiten, Sicherheitsmerkmalen und Zugänglichkeit verbessert werden.

CRP Technology hatte bereits reichlich Erfahrung im Raumfahrtsektor gesammelt unter Verwendung der patentierten Verbundwerkstoffe Windform® TOP-LINE. Die meisten der Windform®-Materialien eignen sich für Anwendungen in der Raumfahrt, da sie die Ausgasungstests von NASA und ESA bestanden haben. Nach einer Analyse der 2D- und 3D-Dateien entschied sich CRP Technology gemeinsam mit Alba Orbital für das selektive Lasersintern und den Werkstoff Windform® XT 2.0 aus der Produktreihe Windform® TOP-LINE. Auch das Elektromotorrad „Energica Ego“ wurde mit Windform Materialien hergestellt.



Viele Komponenten des AlbaPod 2.0 wurden mit Windform® XT 2.0 in 3D gedruckt (Bild © Alba Orbital).



Der AlbaPod 2.0 schlug sich sehr gut bei eingehenden Schwingungstests (Bild © Alba Orbital).

#### Windform® XT 2.0

Windform® XT 2.0 bietet bessere mechanische Eigenschaften als sein Vorgänger Windform® XT. Es verhielt sich um 8 % besser bei der Bruchlast, um 22 % besser beim Elastizitätsmodul und um 46 % besser bei der Bruchdehnung. Viele strukturell wichtige Komponenten wie der bewegliche Auswurfmechanismus und der Mechanismus für die Montage der Tür wurden mit Windform® XT 2.0 Material hergestellt.

Der AlbaPod 2.0 bestand die Kontrollverfahren und erfüllte die Anforderungen und Standards von Alba Orbital. Bei eingehenden Schwingungstests erzielte der AlbaPod v2 ebenfalls sehr gute Ergebnisse. Die Freisetzung des von CRP Technology hergestellten AlbaPod 2.0 ist für Ende 2020 geplant.



Performance Racing



JUNE 19, 2020

## MOTORSPORTS COMPANIES ADJUST OPERATIONS IN RESPONSE TO COVID-19

f in



Racing businesses have provided updates on their operations in response to the novel coronavirus (COVID-19) outbreak.

### CRP Technology

CRP Technology is fulfilling orders, and manufacturing several functional prototypes of emergency valves for reanimation devices and link-components for emergency respiratory masks for assisted ventilation. The CRP Technology's Rapid Prototyping Department has used 3D printing technology called HSS (High Speed Sintering) and the Windform P1 isotropic material to make both types of components. For more information, visit [crptechnology.com](http://crptechnology.com).



## Composites World



6/3/2020 | 3 MINUTE READ

REINFORCEMENTS | CARBON FIBERS | MATERIALS | PROCESSES | ADDITIVE MANUFACTURING

### Satellite deployer redesign supported by 3D-printed composites

A Scottish technology company employs additive manufacturing and CRP Technology composite materials for a lighter, more manufacturable PocketQube deployer.

#space



EDITED BY HANNAH MASON

Associate Editor, CompositesWorld

#### SHARE



#### READ NEXT

- › Small sat demonstrator enabled by CRP Technology's Windform composite materials
- › High strain composites for satellite applications
- › Tooling, precision enable composites in satellite subsystems

#### CW COLLECTIONS



Source | CRP Technology

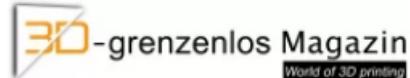
The initial idea for PocketQubes, first proposed by Professor Robert J. Twigg of Morehead State University (MSU, Morehead, Ky., U.S.), was to develop "a satellite that fits in your pocket." The result is a miniaturized satellite with a typical size of 5 cubic centimeters — which is one-eighth the volume of a CubeSat — with a mass of no more than 250 grams. Commercial off-the-shelf components can be used for its electronics.

#### CW COLLECTIONS

PocketQubes, first developed in 2009, are designed to de-orbit and decay upon re-entry into the earth's atmosphere, a process that takes 6-12 months depending on the size of the satellite, the altitude they are deployed from and other factors.



## 3D-grenzenlos Magazin



3D-Druck-News » 3D-Objekte » Airbagsystem mit Halterung aus dem 3D-Drucker optimiert

Joyson Safety Systems:

### Airbagsystem mit Halterung aus dem 3D-Drucker optimiert

16. Juni 2020 von Remziye Körner in 3D-Objekte



Joyson Safety Systems untersuchte Technologien für die Herstellung eines neuen, sichereren und effizienten Airbag-Gehäuses. Dabei stieß Joyson auf das Unternehmen CRP Technology mit dem Verbundmaterial Windform® SP. In Zusammenarbeit entstand schließlich für das Airbag-System eine optimierte Halterung aus dem 3D-Drucker.

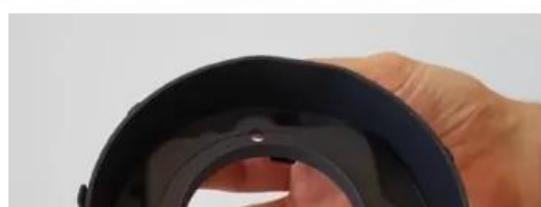
Joyson Safety Systems aus den USA untersuchte Bereiche der additiven Fertigung auf neue Verfahren und Materialien für die Herstellung ihres entwickelten Airbag-Gehäuses. Eine Marktanalyse führte die Ingenieure zu dem Verbundwerkstoff, der dem sonst verwendeten Material am nächsten kommt. Normalerweise bestehen Fahrer-Frontairbags aus einem Polymer (Nylon 6), das zu 40 % glasfaser verstärkt ist (PA6-GF40), wie CRP Technology in einer Fallstudie erklärt.



### Das Airbagsystem

Das Airbagsystem besteht aus einem Gasgenerator (Inflator), einem aufblasbaren Kissen, der Abdeckung und der Halterung mit den Befestigungen am Lenkrad. Das Kissen befindet sich zwischen der Halterung und der Abdeckung. Es ist wichtig, eine korrekt funktionierende Halterung für das Fahrer-Airbag zu haben, da sonst die Sicherheit nicht gewährleistet werden kann. Die Halterung behält die gesamte passive Sicherheitseinrichtung an ihrem Platz, während sich bei einem Aufprall das Airbag-Kissen mit einer Geschwindigkeit von ca. 30-50 aufbläst und so Verletzungen verhindert.

Samer Ziadeh und Daniel Alt vom Joyson Safety Systems Innovation Center erklären in der Mitteilung zur Fallstudie, dass die Halterung eine große Menge an dynamischen Belastungen standhält und den Gasgenerator und das aufblasbare Kissen während und nach der Entfaltung an Ort und Stelle hält. Bei den Tests werden daher hohe Spannungen direkt auf das Airbagsystem und insbesondere auf die Airbaghalterung ausgeübt. Das verwendete Material für den 3D-Druck der Halterung muss eine angemessene Belastbarkeit, Stoßfestigkeit und thermische Stabilität aufweisen, um unter verschiedenen Prüfbedingungen ordnungsgemäß zu funktionieren.





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GASTBEITRÄGE

## Erfolgreicher Einsatz von professionellem 3D-Druck und Verbundmaterial bei der Herstellung eines 6p PocketQube-Freisetzungssystems

von CRP Group - Jun 25, 2020



*Alba Orbital wandte sich für die Konstruktion eines innovativen System für die Freisetzung in die Umlaufbahn an CRP Technology.*

*Das Ergebnis ist AlbaPod 2.0, der vollständig im professionellen 3D-Druck und mit Windform® XT 2.0 hergestellte*

*Deployer für die Freisetzung der weltweit modernste Kleinsatelliten.*

### EINLEITUNG

Die ursprüngliche Idee für den PocketQube stammt von Professor Robert J. Twiggs von der Morehead State University (MSU), der den Standard eines „Satelliten, der in Ihre Tasche passt“ vorschlug.

In der Tat ist ein PocketQube eine Art Miniatursatellit, der in der Weltraumforschung eingesetzt wird, mit einer Größe von etwa 5 Kubikzentimetern (ein Achtel des Volumens eines CubeSat) und einem Gewicht von maximal 250 Gramm.

Es handelt sich um eine eher neue Art von Satelliten – die ersten stammen aus dem Jahr 2009 – aber die Bedeutung von PocketQube als Alternative zu den immer teurer werdenden Freisetzungen von CubeSat in die erdnahen Umlaufbahnen, nimmt unaufhaltsam zu.

Der erste Standard geht auf Juni 2018 zurück, als eine gemeinsame Plattform ins Leben gerufen wurde. Unter den Befürwortern dieser Plattform befand sich (mit GAUSS Srl und TU Delft) Alba Orbital, ein schnell wachsendes High-Tech-KMU mit Sitz in Glasgow, Schottland.



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Press release

## Successful use of professional 3D printing and high-performance composite material in the manufacturing of airbag housing container

06-29-2020 10:09 AM CET | Science & Education  
Press release from: CRP Technology



3D printed functional airbag housing container manufactured by CRP Technology for Joyson Safety Systems

As Joyson Safety Systems project and application, it is the first functional prototype to be produced with Laser Sintering process by using CRP Technology's Carbon reinforced composite material Windform® SP

Joyson Safety Systems' Core innovations team started a project to explore and deep dive into the Additive Manufacturing field, also pointing out to its possibilities and potentials to discover new processes and materials to use for the manufacturing of airbag housing container.

The performance of the DAB housing part is extremely essential, due to the fact that it's a safety component in the vehicle.

The Joyson Safety Systems' Core innovations team explains, "after running some market analysis in order to find out the most suitable material and process that could deliver the required performance, we came across the CRP Technology's Windform® TOP-LINE family of composite material and, specifically, the Windform® SP.

Windform® SP brought our attention to the fact that it's a material produced from polyamide PA grades and reinforced

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GASTBEITRÄGE

## Erfolgreicher Einsatz von professionellem 3D-Druck und Verbundmaterial bei der Herstellung eines 6p PocketQube-Freisetzungssystems

von CRP Group - Jun 25, 2020



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Alba Orbital stellt ein Supportzentrum für PocketQube zur Verfügung, und zwar nicht nur durch den Bau eigener Plattformen, sondern auch durch die Bereitstellung von Komponenten und die Unterstützung von Unternehmen, Universitäten und Raumfahrtbehörden aus der ganzen Welt bei der Freisetzung von PocketQubes in die Umlaufbahn.

### DIE HERAUSFORDERUNG

Vor Kurzem beschloss Alba Orbital, eine aktualisierte Version (2.0 oder v2) seines Pocketqube-Freisetzungsgeräts, genannt AlbaPod, herzustellen, um Verbesserungen bei Gewicht, Produktionsmöglichkeiten, Sicherheitsmerkmalen und Zugänglichkeit zu erzielen.



**Press Office Manager**  
**Veronica Negrelli**  
[www.crp-group.com](http://www.crp-group.com) – [www.windform.com](http://www.windform.com)

**July 2020**

## Moto GP



News   
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### Piloti, squadre e sponsor del MotoGP™ vs il Covid-19

Alla pandemia del coronavirus i protagonisti del MotoGP™ si sono mobilitati attraverso numerose iniziative

Energica (CRP Technology), l'azienda costruttrice delle MotoE™ impegnate nella Coppa del mondo FIM ENEL MotoE™, sta sfruttando le sue competenze, le stesse che hanno portato l'Energica Ego Corsa ad ottenere un successo incredibile, sono ora impegnate per combattere il coronavirus. L'azienda emiliana sta producendo diversi prototipi funzionali utili a combattere l'emergenza come dispositivi di rianimazione, componenti di collegamento per maschere respiratorie per la ventilazione assistita, tutto questo utilizzando la produzione di additivi e il proprio materiale isotropo brevettato Windform® P1. Le valvole sono attualmente in fase di test in un ospedale in Lombardia.



## MM Maschinenmarkt



Home > Additive Fertigung > Ein Stück Airbag aus dem 3D-Drucker



Kunststoff

### Ein Stück Airbag aus dem 3D-Drucker

08.07.2020 | Redakteur: [Simone Käfer](#)

Per Rapid Prototyping wird ein Material und die Additive Fertigung auf ihre Tauglichkeit für Sicherheitssystem im Auto geprüft. Doch zuerst muss das passende Material gefunden werden.



Ein Teil dieses Airbags wurde per Additiver Fertigung hergestellt.

(Bild: joyson Safety Systems)

- Eine Halterung für Airbags muss viel aushalten.
- Ein Ersatzwerkstoff für das glasfaserverstärkte PA6 wird gesucht.
- Ein Prototyp entsteht per selektivem Lasersintern (SLS).

Die Halterung eines Fahrerairbags verhindert, dass Kopf und Gesicht bei einem Unfall auf Lenkrad oder Armaturenbrett aufprallen. Bei einem Zusammenstoß bläst sich das Airbag-Kissen mit 30 bis 50 ms auf, die Halterung hält die gesamte Sicherheitseinrichtung an ihrem Platz. Sie ist ein unverzichtbarer

Bestandteil des Airbag-s. Zum Airbag-System gehören auch ein Gasgenerator (Inflator), der das Kissen aufbläst, und die Abdeckung. Das Kissen befindet sich zwischen der Halterung und der Abdeckung.

Samir Ziadeh und Daniel Alt arbeiten im Innovation Center des US-amerikanischen Airbag-Herstellers Joyson Safety Systems. Sie erklären, dass die Funktion der Halterung des Airbag-Systems darin besteht, „einer großen Menge an dynamischen Belastungen standzuhalten und zusätzlich den Gasgenerator und das aufblasbare Kissen während und nach der Entfaltung des Airbag-Moduls an Ort und Stelle zu halten.“ Diese Belastung entsteht durch den Druck, der zum Aufblasen des Airbags erforderlich ist, weshalb bei den Tests hohe Spannungen direkt auf das Airbag-System und insbesondere auf die Airbag-Halterung ausgeübt werden. „Außerdem“, fahren Ziadeh und Alt fort, „werden die Systeme in einem Temperaturbereich zwischen –35 °C und 85 °C getestet.“ Daher muss das für die Herstellung der Halterung verwendete Material eine angemessene Belastbarkeit, Stoßfestigkeit und thermische Stabilität aufweisen. Zumeist besteht die Halterung aus dem Polymer PA6, das zu 40 % glasfaserverstärkt ist (PA6-GF40).



## Mission Additive



Kunststoff

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15.07.2020 | Redakteur: [Simone Käfer](#)

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## Composites World



7/15/2020 | 2 MINUTE READ

REINFORCEMENTS | CARBON FIBERS | MATERIALS | MARKETS | AUTOMOTIVE

### Airbag housing prototype puts 3D-printed composites to the test

A feasibility study demonstrated the cost- and time-saving potential of replacing a part's current materials and processes with additive manufacturing.



EDITED BY [HANNAH MASON](#)

Associate Editor, CompositesWorld

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- › Tepex reinforces child seat headrest demonstrator
- › Satellite deployer redesign supported by 3D-printed composites
- › Composite output shaft ready for automotive proving ground



The 3D-printed composite airbag housing container prototype housing within a full steering wheel.  
Source | CRP Technology and Joyson Safety Systems

For more than a century, Joyson Safety Systems (Auburn Hills, Mich., U.S.) has been involved in the design, manufacture and sale of safety components for a variety of markets, including airbags, seatbelts, steering wheels and safety electronics for the automotive industry.

The company recently conducted a feasibility study to explore the potential for other existing materials and processes to improve products such as its Driver Airbag (DAB) housing container, leading to a proof of concept that took advantage of composite additive manufacturing.

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## Joyson Safety 3D Prints Functional Airbag Housing Using Windform

July 12, 2020 • by Tarun Tampi • 3D Design • 3D Printing Materials • Additive Manufacturing Processes • Aerospace 3D Printing • Automotive 3D Printing • Carbon Fiber • Space 3D Printing



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Joyson Safety Systems, a leading provider of mobility safety components, systems and technology, recently developed its first functional 3D printed prototype of a [Driver Air Bag \(DAB\) housing](#), using selective laser sintering (SLS) and Windform composite material from CRP Technology.

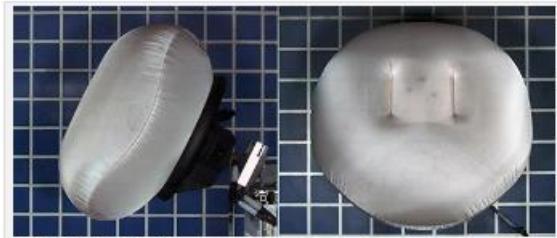


Image courtesy CRP Technology

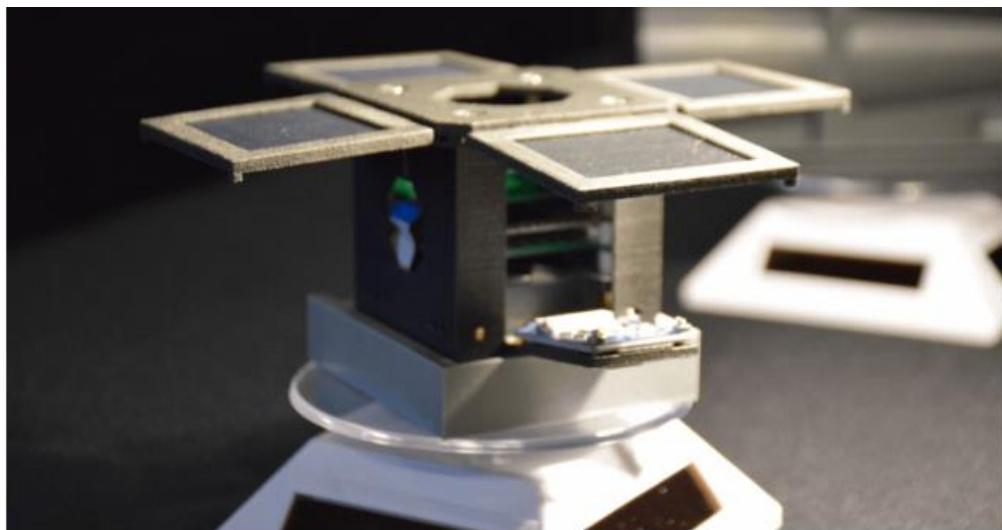
Joyson Safety Systems already has a history of pioneering innovation in mobility safety solutions, such as airbags, seatbelts, safety electronics and more, for automotive and non-automotive markets. Worth noting is the fact that it was the first manufacturer to supply leading OEMs in North America and Europe with steering wheels with Hands on Detection (HOD) for autonomous driving. In this instance, the company's Core Innovations team looked to quickly develop prototypes for its airbag housing and turned to additive manufacturing to explore new processes and materials.





Develop3D

## DEVELOP3D



3D PRINTING NEWS

### PocketQube satellites built with carbon reinforced nylon laser sintering material



Posted on July 23, 2020 by Al Dean

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f t in P g = <

Mini-Cubes has used CRP's carbon reinforced nylon laser sintering material to build small scale satellites.

Founded in 2018 to take the concept of a PocketQube and develop it into a viable product. A PocketQube is derived from the concept of a [CubeSat](#) and is a format for small scale satellites that fit within a 50mm x 50mm x 50mm volume and have a mass of less than 25grams, typically used for research purposes (there's more on PocketQubes [here](#)).

According to Joe Latrell, CEO of Mini-Cubes, his team did this on the principle that virtually anyone can reach space today. With PocketQube satellites, they hope to achieve a better grasp on resource monitoring and give the public a chance to be among the stars.

Mini-Cubes CEO, Joseph Latrell, and his team started a new project based on a new 1P PocketQube flight-ready, named Discovery. He turned to [CRP USA](#) for the manufacture of the entire satellite frame using additive manufacturing – having worked with additive processes to prototype rocket fins at an aerospace company.



JEC



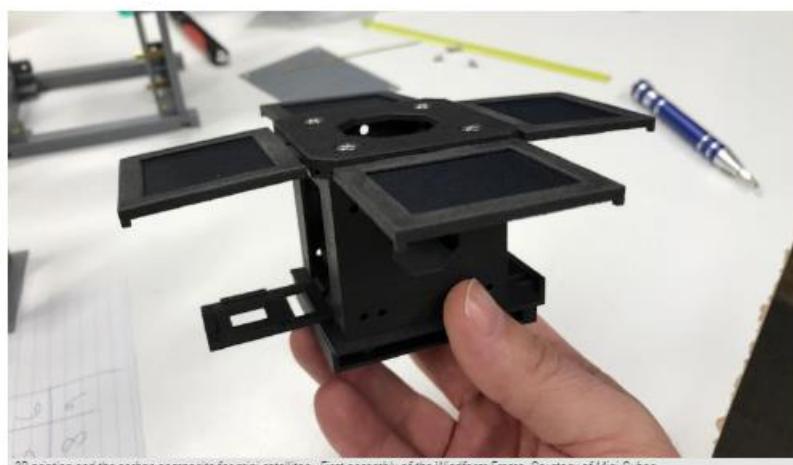
## 3D printing and carbon composite for mini satellites

International French

24 JUL 2020



For the first time, three ready-to-fly functional PocketQube prototypes were produced by CRP USA using Windform® XT 2.0 and the laser sintering process.

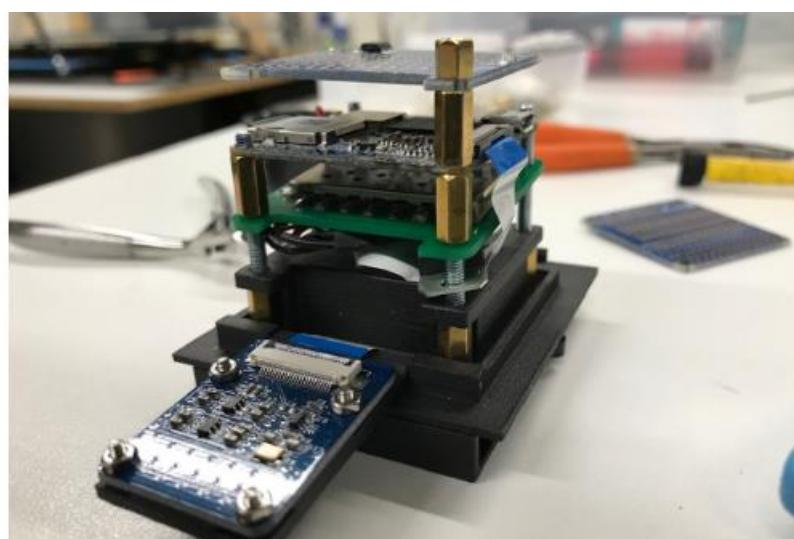


3D printing and the carbon composite for mini satellites - First assembly of the Windform Frame. Courtesy of Mini-Cubes.

They were produced for Mini-Cubes, a Company founded in 2018 to produce a super small satellite called "PocketQube", based on the idea of Joe Lattrell, the company's CEO, that anyone can have their satellite in space.

Recently Joe Lattrell and his team started a new project based on a new flight-ready PocketQube 1P, called Discovery. CRP USA was asked to produce the entire satellite frame by the additive manufacturing given the considerable experience gained by providing cutting-edge solutions for space sector leaders using the laser sintering process and Windform TOP-LINE reinforced composite materials, created by CRP technology based in Italy.

The goal was to be able to produce a very small satellite but equipped with a camera for visual observation, to create a series of PocketQube satellites dedicated to monitoring water.





## 3D Printing Industry



AEROSPACE

# MINI-CUBES SUCCESSFUL IN 3D PRINTING FLIGHT-READY MINI SATELLITES

KUBI SERTOGLU - JULY 24TH 2020 - 11:11AM 0 0 0

A photograph showing a person's hand holding a black, multi-layered 3D printed satellite frame. The frame is rectangular with various cutouts and mounting points. In the background, there are other components of the satellite and some tools on a workbench.

Miniature satellite manufacturer [Mini-Cubes](#), with the help of 3D printing service provider [CRP USA](#), has developed and produced three 3D printed, flight-ready PocketQubes.

The satellites were manufactured out of a carbon fiber reinforced composite material, [Windform XT 2.0](#), using polymer SLS technology. According to Mini-Cubes, it is the first company in the world to employ the material type for this specific application – with promising results, no less.



First assembly of the Windform Frame. Photo via Mini-Cubes.

### A 3D printed Discovery

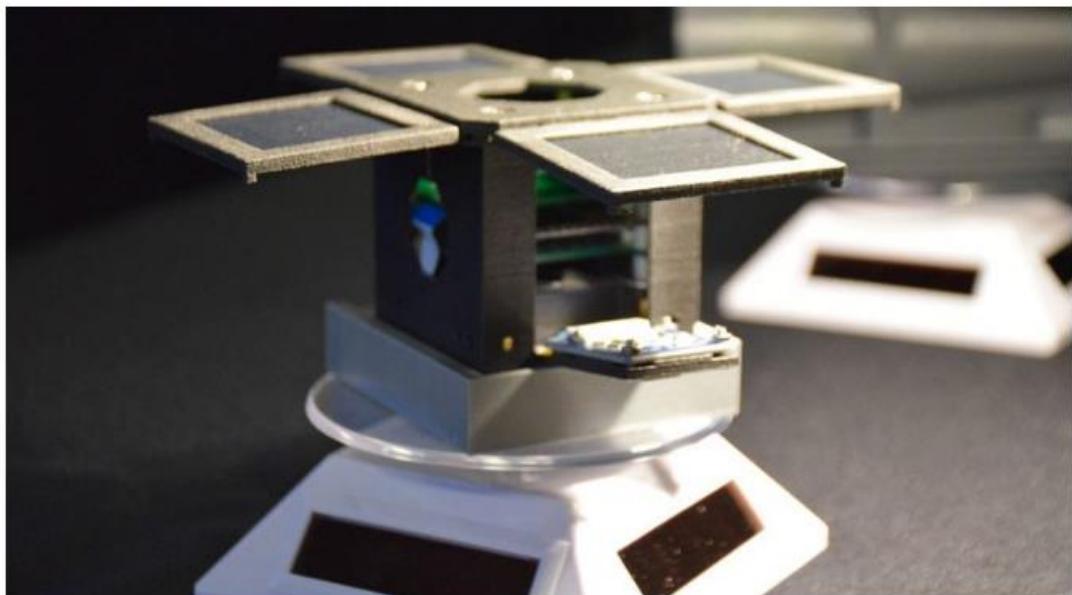
Mini-Cubes' satellite is named Discovery, and its primary purpose is to monitor natural resources on the surface of the Earth. This particular project was intended as a proof-of-concept for the company's design. Joe Latrell, CEO of Mini-Cubes, had his first run-in with additive manufacturing a few years ago when he was prototyping rocket fins for his former aerospace employer. Seeking to leverage the technology once again, he turned to CRP USA to 3D print the frame of the satellite in its entirety.

Latrell explains: "We wanted to include a camera for visual observation, just to see if it could be done. If the process works, we can use the technology to create a constellation of PocketQube satellites just for monitoring a specific resource. In our case, that resource is water."

### Challenges on the road to orbit



## The Additive Journal



### Nano-satelliti costruiti con la stampa 3D

⌚ 77 Views 🌐 additive, aerospaziale, CRP USA, materiale composito, satelliti

CRP USA, l'azienda statunitense partner dell'italiana CRP Technology, ha costruito tre modelli di nano-satelliti per la società Mini-Cubes.

Si tratta della fase 1 di un ampio progetto volto alla realizzazione di un intero sciame di nano-satelliti in stampa 3D professionale per il monitoraggio delle risorse idriche della terra. Per la prima volta interi prototipi funzionali di 1P PocketQube pronti per l'impiego nello spazio sono stati realizzati utilizzando un materiale composito rinforzato fibra di carbonio - il Windform® XT 2.0 - e il processo di sinterizzazione laser selettiva.

CRP USA ha realizzato per Mini-Cubes tre prototipi funzionali di 1P PocketQube: due per i test e uno per il volo in orbita.



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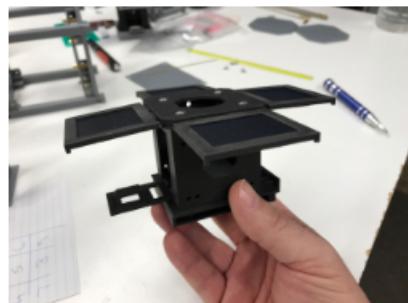


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**PRESS RELEASES**

## Successful use of Carbon-composite Windform® XT 2.0 and Laser Sintering in the construction of 1P PocketQubes flight-ready

By [Press Releases](#) - Jul 24, 2020



**US-based CRP USA manufactured three engineering models for Mini-Cubes. It is the first time that entire PocketQube functional prototypes flight-ready are manufactured using a Carbon-reinforced composite material – Windform® XT 2.0 – and Laser Sintering process**

Recently Joseph Latrell, CEO of Mini-Cubes, LLC and his team started a project based on the engineering of a new 1P PocketQube flight-ready, named Discovery. The aim of the project is the creation of a constellation of PocketQube satellites for monitoring a specific Earth's resource, water.

Latrell turned to CRP USA for the manufacture of the entire satellite frame via Laser Sintering process using one material from the Windform® TOP-LINE family of composite materials for Laser Sintering, the Carbon fiber reinforced Windform® XT 2.0, created by Italy-based CRP Technology.

The main challenges were related to the small dimension of the satellite and to the material – since it was the first time that an entire satellite would be built from a Carbon-composite material.

Joe Latrell comments, "Discovery is a PocketQube satellite. These spacecraft are amongst the smallest with 50mm x 50mm x 50mm internal volume. Our particular satellite is a demonstration of what can be done for remote sensing of Earth's resources on that scale. The challenge with something so small is to fit the electronics, camera, and radio system into it."

The assignment was tough – the Windform® parts in the Discovery would be mission critical.

As Joe Latrell clarifies, "This was the first time an entire satellite would be manufactured from a material like Windform® XT 2.0. Performance is everything. If any one of the parts fail, it would result in complete failure of the spacecraft."



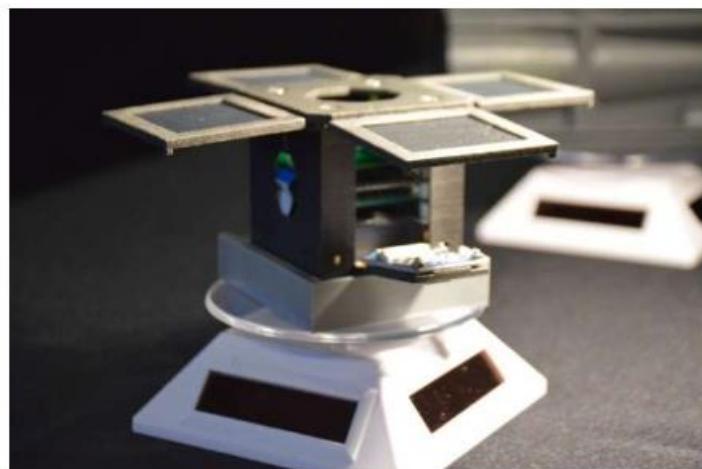
## 3D Printing Creative



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### Nano satelliti per monitorare le risorse idriche della terra nascono in 3D

27 Luglio 2020



Crp Usa, l'azienda statunitense partner dell'italiana Crp Technology, ha costruito tre modelli di nano satelliti per la società Mini-Cubes.

Si tratta della fase 1 di un progetto volto alla realizzazione con la stampa 3D di una flotta di nano satelliti per il monitoraggio delle risorse idriche della terra.

Interi prototipi funzionali di 1P PocketQube pronti per l'impiego nello spazio sono stati realizzati con sintierizzazione laser selettiva utilizzando un materiale composito rinforzato fibra di carbonio, Windform XT 2.0.

L'azienda Mini-Cubes è stata fondata nel 2008 da Joseph Larell per rendere i PocketQube, tipologia di nano satelliti molto piccoli con una dimensione di circa 5 centimetri cubi e con una massa che non supera i 250 grammi, un'alternativa praticabile ai CubeSat, i cui lanci in orbita stanno diventando sempre più costosi.

Recentemente Joe Larell e il suo team hanno avviato un progetto di ingegnerizzazione di un nuovo 1P PocketQube pronto per l'impiego nello spazio, chiamato Discovery 1a.

Per la costruzione di questo pico-satellite Larell si è rivolto a Crp Usa affinché l'intera struttura e alcuni componenti venissero realizzati in stampa 3D.





## 3D Natives

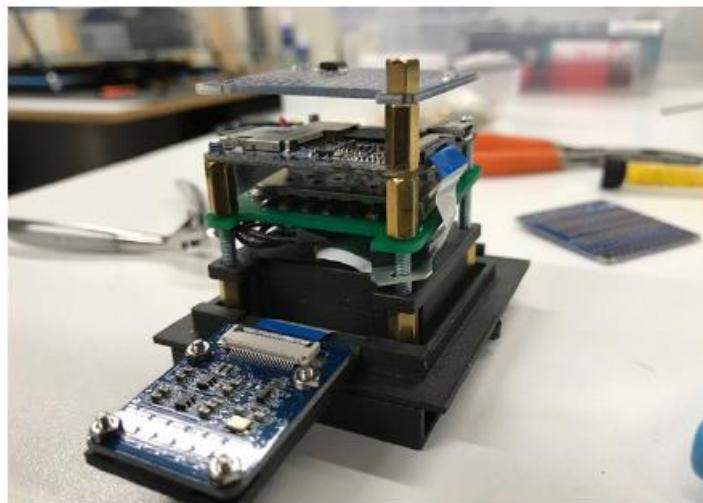


# Discovery, the 3D printed carbon fiber satellite

Published on July 28, 2020 by Aysha M.

Mini-Cubes is a young American company that designs very small satellites: called PocketQubes, they measure only 5 cm and remain more accessible than traditional satellites. The reason we are telling you about it today is because the company has started using additive manufacturing to develop the satellites called Discovery: 3D printed on an SLS machine, they are made of carbon fiber, which ensures high rigidity and remarkable lightness at the same time. According to Mini-Cubes, this is the first time such a material has been used to 3D print satellites capable of going into space.

For its production purposes Mini-Cubes has opted for 3D printing with composites. The CEO of the company, Joe Latrell, explains: *"For me, space is the next big frontier. Instead of seeing it as an impossible challenge, I see it as the source of saving the Earth."* The purpose of the Discovery satellite would be to monitor natural resources on the Earth's surface.



The inside of one of the 3D printed prototypes. (Image credits: Mini-Cubes)

## The manufacturing process of Discovery

Therefore, the team at Mini-Cubes wanted to integrate a camera into the satellite in order to enable the surveillance of our planet's natural resources. It proved to be a relatively complex operation considering the size of the device: the company wanted to create a satellite with an internal volume of only 50 x 50 x 50 mm. So they turned to additive manufacturing, which makes it possible to develop more complex shapes at a lower cost. To 3D print parts of good quality they sought help from CRP USA, a 3D printing service provider. Then, they had to choose the right material that would answer all the requirements needed for space launch. Lightness is an essential point in order to reduce the associated costs as much as possible, but resistance must not be sacrificed. After numerous tests, the two partners opted for Windform XT 2.0, a carbon fibre reinforced polymer.



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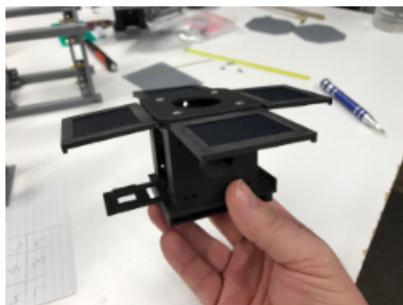


[Home](#) > [Anwendungen](#) > Mini-Cubes erfolgreich beim 3D-Druck von flugbereiten Mini-Satelliten

[ANWENDUNGEN](#)

## Mini-Cubes erfolgreich beim 3D-Druck von flugbereiten Mini-Satelliten

von [David](#) - Jul 28, 2020



**CRP USA, ein amerikanisches Unternehmen und Partner von CRP Technology, hat drei, von Mini-Cubes entworfene Modelle von Kleinsatelliten gebaut. Es ist das erste Mal, dass vollständige funktionale Prototypen von 1P PocketQubes, die für den Einsatz im Weltraum bereit sind, unter Verwendung eines mit Kohlenfaser verstärkten Verbundwerkstoffs – Windform XT 2.0 – und des selektiven Lasersinterverfahrens hergestellt wurden.**

Das Unternehmen Mini-Cubes wurde 2008 von Joseph Latrell mit dem Ziel gegründet, den PocketQube – einen besonders kleinen Kleinsatelliten mit einer Größe von etwa 5 Kubikzentimetern und einem Gewicht von höchstens 250 Gramm – zu einer vernünftigen und umsetzbaren Alternative zum CubeSat, dessen Freisetzungen in die Umlaufbahn immer kostspieliger werden, zu machen.

Vor kurzem haben Joe Latrell und sein Team ein Engineering-Projekt für einen neuen, weltraumtauglichen 1P PocketQube mit dem Namen Discovery 1a gestartet.

Für die Herstellung dieses Kleinsatelliten hat sich Latrell an CRP USA gewandt, um die gesamte Struktur und einige Komponenten in 3D-Druck zu bauen. CRP USA, die US-Tochtergesellschaft von CRP Technology, hat in den letzten fünfzehn Jahren beträchtliche Erfahrungen auf diesem Gebiet gesammelt und bedeutenden, führenden Unternehmen der Raumfahrtindustrie innovative Lösungen unter Verwendung des Lasersinterverfahrens und der von CRP Technology entwickelten Verbundwerkstoffe Windform TOP-LINE geliefert.

Ziel des Projekts von Latrell ist es, eine ganze Konstellation (oder einen Schwarm) von PocketQube-Satelliten zur Überwachung der Wasserressourcen in additiver Fertigung herzustellen.



## Plastix

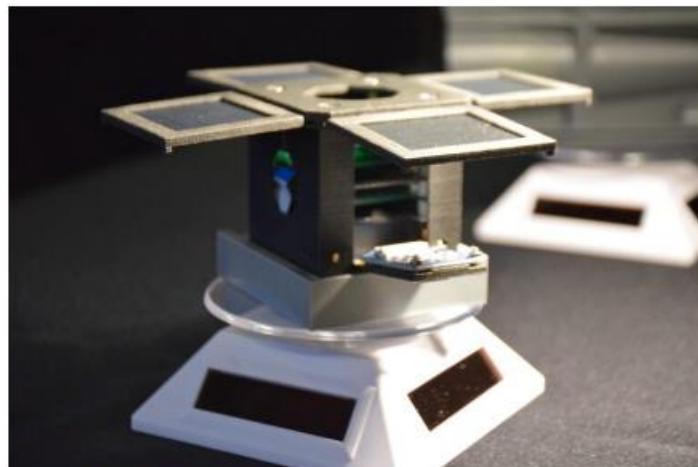


Home > 3D print > Mini satelliti per il monitoraggio delle risorse terrestri stampati in 3D

3D print

### Mini satelliti per il monitoraggio delle risorse terrestri stampati in 3D

Redazione 28 luglio 2020

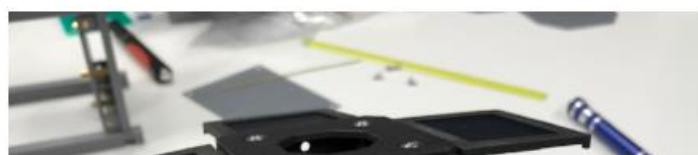


PocketQube Discovery 1a (Foto Mini-Cubes)

Joseph Latrell ha fondato **Mini-Cubes** nel 2008 con l'obiettivo di **sviluppare il concetto di PocketQube - satelliti di dimensioni piccolissime** - rendendolo una soluzione praticabile per il monitoraggio delle risorse terrestri.

Recentemente l'azienda statunitense ha avviato un progetto di ingegnerizzazione di un nuovo 1P PocketQube pronto per l'impiego nello spazio, chiamato Discovery 1a. Latrell ha deciso di realizzare l'intera struttura e alcuni componenti avvalendosi della collaborazione di CRP USA, che nel corso dell'ultimo quindicennio ha sviluppato una notevole esperienza nel campo, fornendo ai key-leader dell'aerospaziale soluzioni all'avanguardia utilizzando il processo di **sinterizzazione laser** e i **materiali compositi Windform® Top-Line** sviluppati dalla consociata italiana **CRP Technology**. Lo scopo del progetto è arrivare a costruire in additive manufacturing un'intera costellazione (o scieme) di satelliti PocketQube per il telerilevamento delle risorse idriche della Terra.

«Date le dimensioni estremamente ridotte (circa 5 centimetri di lato e una **massa che non supera i 250 grammi**), la sfida maggiore era riuscire ad **adattare l'elettronica, la videocamera e il sistema radio all'interno del satellite**» spiega Joseph Latrell. «Un compito non facile, anche perché la rottura di un singolo, minuscolo componente si sarebbe tradotta nel guasto dell'intero satellite. La struttura doveva quindi garantire le massime prestazioni anche nelle rigide e difficili condizioni ambientali dello spazio».





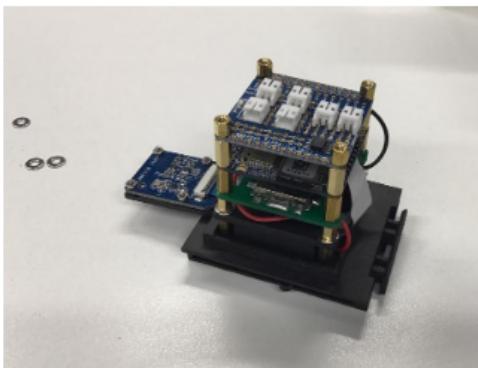
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## Successful use of Carbon-composite Windform® XT 2.0 and Laser Sintering in the construction of 1P PocketQubes flight-ready

07-30-2020 11:26 AM CET | Science & Education

Press release from: CRP USA LLC



The inner workings of the Discovery 1a engineering model in Windform XT2.0. Courtesy of Mini-Cubes

material from the Windform® TOP-LINE family of composite materials for Laser Sintering, the Carbon fiber reinforced Windform® XT 2.0, created by Italy-based CRP Technology.

The main challenges were related to the small dimension of the satellite and to the material - since it was the first time that an entire satellite would be built from a Carbon-composite material.

Joe Latrell comments, "Discovery is a PocketQube satellite. These spacecraft are amongst the smallest with 50mm x 50mm x 50mm internal volume. Our particular satellite is a demonstration of what can be done for remote sensing of Earth's resources on that scale. The challenge with something so small is to fit the electronics, camera, and radio system into it."

The assignment was tough - the Windform® parts in the Discovery would be mission critical.

As Joe Latrell clarifies, "This was the first time an entire satellite would be manufactured from a material like Windform® XT 2.0. Performance is everything. If any one of the parts fail, it would result in complete failure of the spacecraft."

CRP USA manufactured for Mini-Cubes three 1P PocketQubes functional prototypes: two for testing and one for flight.

"Joe's team brings a unique challenge as they are packing a lot in a small package. Our team was able to use our experience with Windform® to help move the project forward," stated Stewart Davis, Director of Operations at CRP USA.

Joe Latrell comments, "We have run quite a few tests with many more on the way. So far we have load tested to over 20 Kg. The material has been vibration tested to NASA GEVS-7000 specifications, subjected to a near vacuum to simulate the conditions in Earth orbit, and thermally tested from +50c to -40c. Windform® XT 2.0 has passed every test we threw at it."

He continues, "The next step for us is to test the satellite on orbit. This will be the final validation for our process. The plan is to launch sometime in Q2 2021."

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**SCARICA**

US-based CRP USA manufactured three engineering models for Mini-Cubes. It is the first time that entire PocketQube functional prototypes flight-ready are manufactured using a Carbon-reinforced composite material - Windform® XT 2.0 - and Laser Sintering process

Recently Joseph Latrell, CEO of Mini-Cubes, LLC and his team started a project based on the engineering of a new 1P PocketQube flight-ready, named Discovery. The aim of the project is the creation of a constellation of PocketQube satellites for monitoring a specific Earth's resource, water.

Latrell turned to CRP USA for the manufacture of the entire satellite frame via Laser Sintering process using one

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## Manufacturing Tomorrow



### Discovery 1a, the 1P PocketQube flight-ready manufactured in professional 3D printing

Visit <https://www.crp-usa.net/3d-printed-nanosatellites-pocketqubes-flight-ready-windform-xt20/> for further information

*A new and complex application, a unique challenge to push the boundaries of what is possible, from the small satellite form factor to the technology used to make it - This is Discovery 1a, the first 1P PocketQube pico-sat flight-ready entirely manufactured using Laser Sintering process and Carbon fiber reinforced composite material Windform XT 2.0. It has been engineered by Mini-Cubes, and manufactured by CRP USA.*

07/30/20, 09:18 AM | Additive & 3D Printing, Design & Development | CRP USA LLC

Recently Joseph Latrell, CEO of Mini-Cubes, LLC and his team started a project based on the engineering of a new 1P PocketQube flight-ready, named Discovery. The aim of the project is the creation of a constellation of PocketQube satellites for monitoring a specific Earth's resource, water.

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Latrell turned to CRP USA for the manufacture of the entire satellite frame via Laser Sintering process using one material from the Windform® TOP-LINE family of composite materials for Laser Sintering, the Carbon fiber reinforced Windform® XT 2.0, created by Italy-based CRP Technology.

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## Industrial Laser Solutions



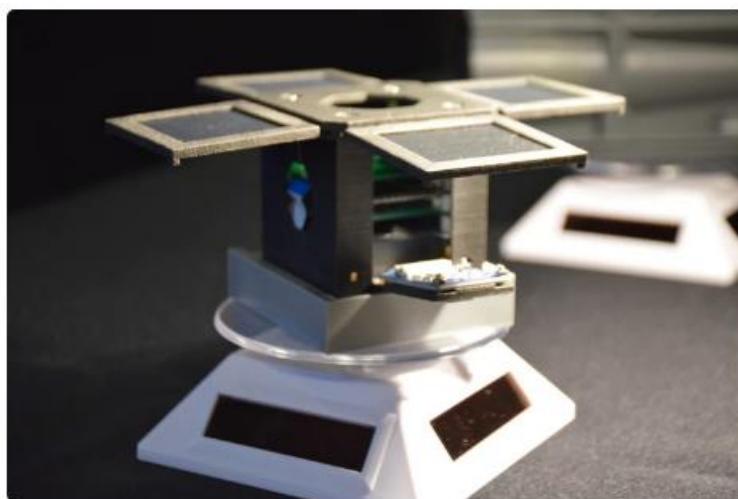
HOME | ADDITIVE MANUFACTURING

### Laser-sintered carbon-composite satellites are flight-ready

Mini-Cubes, LLC turned to CRP USA for the manufacture of the entire PocketQube satellite frame using Windform TOP-LINE composite materials for laser sintering.

Author – David Belforte

Jul 30th, 2020



(Credit: Mini-Cubes, LLC)

Mini-Cubes, LLC (Akron, PA) started a project based on the engineering of a constellation of PocketQube satellites for monitoring a specific Earth resource—water. The company turned to CRP USA (Mooresville, NC) for the manufacture of the entire satellite frame using Windform TOP-LINE **composite materials for laser sintering**, created by CRP Technology (Modena, Italy).

The main challenges were related to the small dimension of the PocketQube satellite and the material, since it was the first time that an entire satellite would be built from a carbon-composite material. These spacecraft are amongst the smallest, with 50 × 50 × 50 mm internal volume.

"Discovery, our particular satellite, is a demonstration of what can be done for remote sensing of Earth's resources on that scale. The challenge with something so small, is to fit the electronics, camera, and radio system into it," says Joe Latrell, CEO of Mini-Cubes. "The assignment was tough—the Windform parts in the Discovery would be mission-critical."

As Latrell clarifies, "This was the first time an entire satellite would be manufactured



## Industrial Laser Solutions



[HOME](#) | [ADDITIVE MANUFACTURING](#)

### Additive manufacturing method is successful for making airbag housing container

Joyson Safety Systems started a project to investigate the additive manufacturing field, looking at its possibilities and potentials to discover new processes and materials to use for manufacturing an airbag housing container.

Author — David Belforte

Jul 2nd, 2020



The Driver Airbag (DAB) housing in Windform SP manufactured via the laser sintering process by CRP Technology.

[View Image Gallery](#)

The core innovations team at Joyson Safety Systems (Aschaffenburg, Germany) started a project to investigate the **additive manufacturing** field, looking at its possibilities and potentials to discover new processes and materials to use for manufacturing an airbag housing container. The company provides safety-critical components, systems, and technology to the automotive and non-automotive markets.

The performance of the Driver Airbag (DAB) housing part is extremely essential, as it is a safety component in the vehicle.

After running some market analysis in order to find out the most suitable material and process that could deliver the required performance, the Joyson Safety Systems team learned about **CRP Technology's Windform TOP-LINE family of composite materials** and, specifically, the **Windform SP material**.

Windform SP, which is produced from polyamide grades and reinforced with carbon



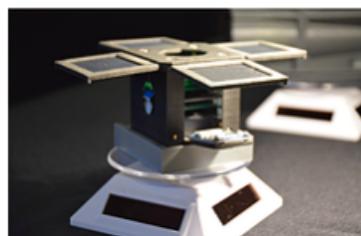
## Satellite Evolution



Industry 4.0   NewSpace

### Mini-Cubes achieves successful use of Carbon-composite Windform® XT 2.0 and professional 3D printing in the construction of 1P PocketQubes flight-ready

July 24, 2020 by Satellite Evolution Group



Mini-Cubes, LLC was founded in 2018 to take the concept of a PocketQube – a super small satellite – and develop it into a viable product. Joe Latrell, CEO of Mini-Cubes, and his team did this on the principle that virtually anyone can reach space today. With PocketQube satellites, they hope to achieve a better grasp on resource monitoring and give the public a chance to be among the stars.

#### The project

Recently Joseph Latrell and his team started a new project based on a new 1P PocketQube flight-ready, named Discovery.

He turned to CRP USA for the manufacture of the entire satellite frame via Additive Manufacturing.

CRP USA, 3D printing company based in Mooresville (NC), has built a considerable experience supplying cutting-edge solutions for space key industry leaders using Laser Sintering process and Windform® TOP-LINE reinforced composite materials, created by Italy-based CRP Technology.

The primary objective of the project was proof of concept for satellites this small. Joe Latrell explains, "We wanted to include a camera for visual observation, again just to see if it could be done. If the process works, we see using the technology to create a constellation of PocketQube satellites just for monitoring a specific resource. In our case that resource is water."

Joe went to professional 3D printing since he has been a fan of Additive Manufacturing for some time now, as he explains, "I first used the process for making prototype rocket fins when I worked at an aerospace company."

When we started working on Discovery, I knew I wanted to push the boundaries of what was possible – everything from the small satellite form factor to the technology used to make it. For that reason I decided to involve CRP USA team and their Director of Operations, Stewart Davis. I knew that with their expertise and experience in the sector, they would be the ultimate technological partner for the project!"



#### The challenge

The main challenges were related to the small dimension of the satellite and to the material - since it was the first time that an entire satellite would be built from a Carbon-composite material.

Joe Latrell comments, "Discovery is a PocketQube satellite. These are spacecraft that are as small at 50mm x 50mm x 50mm internal volume. Our particular satellite is a demonstration of



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**Veronica Negrelli**  
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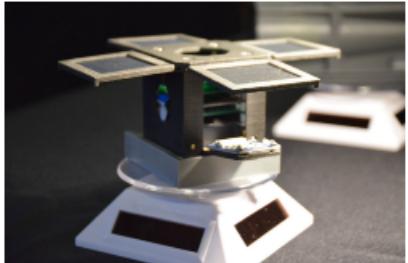


Home > Press Releases > CRP USA is AS9100 certified

**PRESS RELEASES**

## CRP USA is AS9100 certified

By Press Releases - Sep 30, 2020



CRP USA, pioneering company in the fields of Additive Manufacturing and high performance composite materials, announced it has recently achieved AS9100 Rev. D certification for the manufacture of 3D printed aerospace products from its customer's component design data. AS9100 Rev. D certification signifies CRP USA's ongoing commitment to meeting and exceeding increasingly stringent industry requirements for aerospace related products.

"We have taken our expertise in Additive Manufacturing solutions to new heights to produce parts for the most demanding sectors as Aerospace and Defense," says Stewart Davis, Director of Operations, CRP USA. "Our team is working alongside key space industry leaders, supplying value-added high-performance 3D printed products to meet their needs. AS9100 Rev.D certification reflects our dedication to achieving the highest standard of customer satisfaction; moreover, it is a further demonstration of the effectiveness of additive manufacturing and use of Windform as structural materials for space and aerospace applications."

AS9100 is the international Quality Management System standard for the Aviation, Space and Defense (AS&D) industry, created by the IAQG (the International Aerospace Quality Group). AS9100 Rev D (2016) is the most recent version. It specifies requirements for a quality management system where an organization wishes to demonstrate its ability to consistently provide product that meets ASD customer and applicable statutory and regulatory requirements.





## JEC Composites

**A new deployer for pocket satellites**

CRP Technology, the Italian additive manufacturing specialist, has been working with Alba Orbital, which supplies parts and launchers to companies, universities and space agencies. Together, they've built the AlbaPod 2.0. This second generation deployer features a weight and manufacturability that have been updated to suit PocketQube satellites. These mini satellites literally fit "in your pocket", thanks to their 5cm footprint and weight of a mere 250g, and are designed to carry out space research at lower launching costs than CubeSat satellites.

For some time now, CRP Technology has provided its expertise as well as its 3D printing equipment to the space industry. The majority of its Windform TOP-LINE composite materials are approved for use by the main launching suppliers, following successful degassing tests by NASA and ESA. For this project, they chose selective laser sintering of the Windform XT 2.0 carbon composite. This material is a lightweight polyamide that has not been degassed, and is reinforced with fibres similar to nylon. Its fibres furnish the tenacity and strength the deployer needs to withstand a launch into space that comprises several satellites.

[www.albaorbital.com](http://www.albaorbital.com)  
[www.crptechnology.com](http://www.crptechnology.com)

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N°136 September - October 2020 / JEC COMPOSITES MAGAZINE

55

**SOLUTIONS aerospace**

**Composites push back the final frontier**

**M**ore than ever before, the sky is a stage for innovation. CRP Technology is one of the leaders in bringing the world of space and communications, with its global network of partners, to the forefront of the industry. It provides the tools and resources needed to meet our current global requirements in aerospace, defence and security, and is well positioned to support the continued development of aircraft, defence and telecommunications. CRP Technology offers a wide range of services, from design and engineering, to prototyping and manufacturing, to the delivery of finished products. Our commitment to quality and reliability is reflected in every aspect of our business.

In the aerospace sector, the use of composites is becoming increasingly common. CRP Technology has developed a range of solutions to help aerospace manufacturers to increase their efficiency. The applications are numerous, from the use of composites in the construction of aircraft components to the use of composites in the manufacture of aerospace structures. CRP Technology's expertise in the field of aerospace applications is taking place in many different areas, including the development of new materials, the design of new structures, and the implementation of new processes that can be used to develop more efficient and reliable aerospace products.

**Manufacturing solutions**

The French Composite Center has created a new manufacturing solution for aerospace applications. This solution involves the use of a 3D printer to produce complex parts for aerospace applications. The printer is able to print parts with a resolution of up to 100 micrometers, making it ideal for the production of intricate parts for aerospace applications. The printer is also able to print parts with a resolution of up to 100 micrometers, making it ideal for the production of intricate parts for aerospace applications.

**Composite push back the final frontier**

**C**omposite materials are revolutionizing the aerospace industry. CRP Technology has developed a range of solutions to help aerospace manufacturers to increase their efficiency. The applications are numerous, from the use of composites in the construction of aircraft components to the use of composites in the manufacture of aerospace structures. CRP Technology's expertise in the field of aerospace applications is taking place in many different areas, including the development of new materials, the design of new structures, and the implementation of new processes that can be used to develop more efficient and reliable aerospace products.

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September - October 2020



## 3D Printing Industry



APPLICATIONS

### CRP TECHNOLOGY 3D PRINTS SENSOR HOUSING BOX FOR IMAL USING WINDFORM MATERIALS

PAUL HANAPHY - SEPTEMBER 15TH 2020 - 10:41AM 0 0

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SHARES



3D printing materials and services provider [CRP Technology](#) has deployed its proprietary Windform XT 2.0 polymer to fabricate an end-use sensor housing box for one of its clients.

Commissioned by the machine part producer IMAL, the functional quality control component was entirely created using additive manufacturing, and later finished using CNC machining. By deploying its end-to-end manufacturing service, CRP was able to rapidly produce the parts that IMAL required, with strong resistance qualities and a high level of surface finish.

The final product left new-adopters IMAL very impressed with the level of precision that could be achieved via CRP's 3D printing solutions. "This is our first experience with professional 3D printing, and we are very satisfied," commented an IMAL spokesperson. "Working with CRP Technology we had collaboration, high quality, competence and an open and constructive approach towards us."



IMAL used CRP's 3D printing services to produce a sensor housing box (pictured) for a client. Image via CRP Technology.

#### CRP Technology's range of 3D printing solutions

Although CRP's parent company was founded in 1970, CRP Technology wasn't established until 1996. The original business had strong links to the motorsport industry, and CRP's US base is located near the [NASCAR](#) headquarters. Now the umbrella organization CRP Group Network includes motorbike manufacturer, [Energica](#) as well as [CRP USA](#) and [CRP Meccanica](#).

CRP's additive manufacturing portfolio comprises a line of 3D printing materials and



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## Costruire Stampi



## Componenti per macchine controllo qualità creati in stampa 3D

Settembre 14, 2020 · 73 Views · controllo qualità, CRP Technology, IMAL, stampa 3D

**IMAL**, azienda produttrice di macchinari per la produzione di pannello truciolare, compensato, MDF e OSB, ha realizzato per un importante cliente una macchina controllo qualità da porre a fine ciclo produttivo, basata su tecnologia al TeraHertz/onde millimetriche (T-ray).

Per la realizzazione della scatola di contenimento del sensore della macchina, IMAL ha deciso – per la prima volta – di non affidarsi a scatole commerciali, in quanto non avrebbero soddisfatto i criteri di qualità aziendali, ma alle soluzioni in stampa 3D fornite da **CRP Technology**.

L'applicazione doveva essere realizzata in tempi ridotti, e coniugare elevate prestazioni meccaniche (resistenza ad accelerazioni, sollecitazioni e velocità sostenuta) ad altrettanti elevati standard estetici. L'attività del reparto Stampa 3D di CRP Technology è stata fin dall'inizio improntata alla massimizzazione e al raggiungimento degli obiettivi richiesti.

### Oltre 25 anni di esperienza

Il lavoro è partito da un'attenta analisi dei disegni tridimensionali ricevuti da IMAL. Grazie al know-how acquisito in oltre 25 anni di attività a servizio dei settori industriali più esigenti e performanti, CRP Technology ha potuto assistere IMAL nella scelta della tecnologia e del materiale migliore per la riuscita del progetto: la sinterizzazione laser selettiva e il materiale composito Windform® XT 2.0, che appartiene alla gamma



## CW Composites World



9/18/2020 | 1 MINUTE READ

MACHINING/DRILLING | PROCESSES | ADDITIVE MANUFACTURING

### CRP Technology produces composite sensor housing box

Commissioned by IMAL s.r.l., CRP applied its carbon fiber-reinforced Windform XT 2.0 material, which retains an 8% increase in tensile strength and 22% increase in tensile modulus.



EDITED BY [GRACE NEHLS](#)

Assistant Editor, CompositesWorld

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- › [CRP Technology revises commercial strategy for Windform materials](#)
- › [Looking for opportunity in a pandemic crisis](#)
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Photo Credit: CRP Technology

It was recently reported that [IMAL](#) (Modena, Italy), a global company in machinery for the production of wood particle, plywood, MDF and OSB, commissioned a quality control system to be placed at the end of the production cycle, based on TeraHertz/millimeter wave (T-ray) technology. Rather than use its mass-produced sensor housing boxes, IMAL turned to [CRP Technology](#) (Modena, Italy) for the manufacturing of the functional sensor housing box.

According to CRP, the application had to be created in a short time and to combine high mechanical characteristics — resistance to acceleration, stress and heat — while maintaining a high level of aesthetic standards. CRP Technology chose the selective laser sintering process and the use of its proprietary carbon fiber-reinforced 3D printing material, Windform XT 2.0, which has good mechanical properties and is suitable in demanding applications including motorsports, aerospace and unmanned aerial vehicle (UAV) sectors.

Replacing the previous formula of Windform XT in the Windform TOP-LINE family of composite materials, CRP says its features improvements in mechanical properties including an 8% increase in tensile strength, a 22% increase in tensile modulus and a 46% increase in elongation at break. Further, says CRP, the use of

#### CW COLLECTIONS



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## Industrial Laser Solutions



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### Selective laser sintering manufactures control system component

IMAL turned to CRP Technology for the manufacture of a functional sensor housing box using the company's 3D-printed service with laser sintering process and composite material.

Author — David Belforte

Sep 18th, 2020



The laser-sintered sensor housing box in carbon-filled Windform XT 2.0 composite material.

IMAL S.r.l. (San Damaso, Italy) offers machinery for the production of wood particle, plywood, medium-density fiberboard (MDF), and oriented strand board (OSB). For an important customer, IMAL created a quality control system to be placed at the end of the production cycle, based on terahertz/millimeter wave (T-ray) technology. IMAL turned to **CRP Technology** (Modena, Italy) for the manufacture of the functional sensor housing box using the company's 3D-printed service with laser sintering process and composite material.

For the first time, IMAL did not use mass-produced sensor housing boxes, as they would not have met the quality criteria of the company. "We turned to CRP Technology," IMAL commented, "as we knew they would support us during the entire creation process, advising us on the best choice to get the product we wanted, and to manufacture it in the shortest time. The application had to be created in a short time, and to combine high mechanical characteristics (resistance to acceleration, stress, and heat) while maintaining high-level aesthetic standards."

CRP Technology assisted IMAL in choosing the best laser sintering material to



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## JEC Composites



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### CRP Technology produces composite sensor housing box

International

French

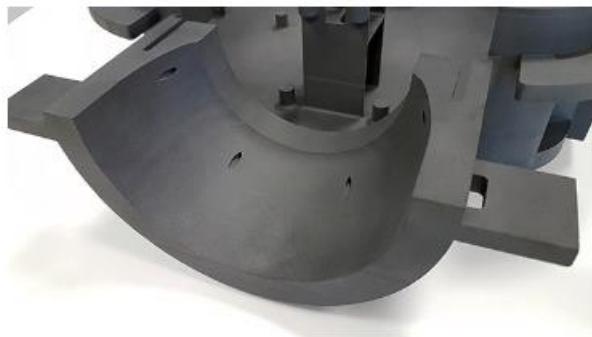
21 SEP 2020

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*CRP Technology produces composite sensor housing box*

The application had to be created in a short time, and to combine high mechanical characteristics (resistance to acceleration, stress and heat) whilst maintaining high level aesthetic standards.



*IMAL sensor housing box manufactured by CRP Technology*

#### How does it work?

Work began with an accurate analysis of the 3D and 2D files. CRP Technology then selects the Laser Sintering process and Carbon-composite Windform XT 2.0 material, from the Windform top-line family of composite materials for LS technology (invented by CRP Technology itself). The choice of the material proved to be particularly appropriate: the sensor housing box

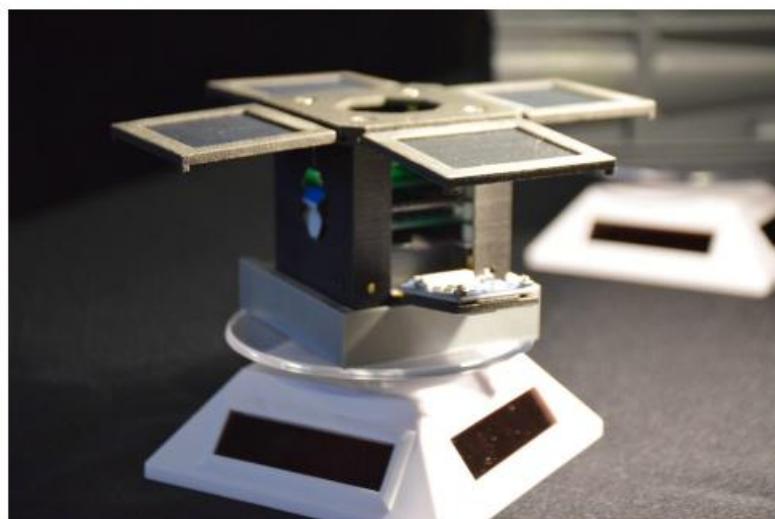


## Aerospace Manufacturing



### CRP USA is AS9100 certified

28 SEPTEMBER 2020 • In News



**CRP USA, a specialist in additive manufacturing and high performance composite materials, has achieved AS9100 Rev. D certification for the manufacture of 3D printed aerospace products.**

AS9100 Rev. D certification signifies CRP USA's ongoing commitment to meeting and exceeding increasingly stringent industry requirements for aerospace-related products.

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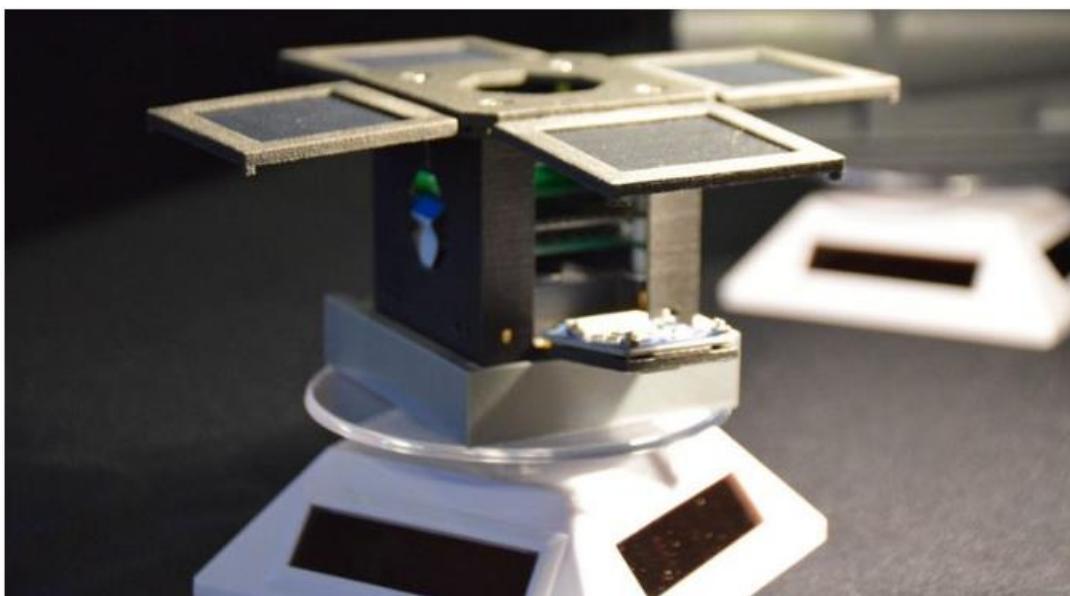
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#### AUTHOR

**Michael Tyrrell**  
Digital Coordinator



## The Additive Journal



### CRP USA ha ottenuto la certificazione AS9100

73 Views · aerospace, certificazione, CRP USA, difesa

CRP USA, filiale statunitense di CRP Technology, ha conseguito la certificazione AS9100 Rev D (2016).

AS9100 non è uno standard di prodotto, ma è lo standard internazionale del sistema di gestione della qualità per l'industria aerospaziale e della difesa (AS&D). È stato creato da IAQG, International Aerospace Quality Group (che riunisce tutti i costruttori aerospaziali al mondo) e AS9100 Rev D (2016) è l'ultima versione. Lo standard attesta che i fornitori in suo possesso, possiedono un sistema di qualità e requisiti idonei per creare e mantenere prodotti sicuri e affidabili per l'industria dell'aviazione civile e militare.

#### Programma condiviso di cooperazione mondiale

"Tutti noi - commenta Stewart Davis, Direttore delle operazioni, CRP USA- siamo molto orgogliosi di aver conseguito questa certificazione. AS9100 rafforza la posizione competitiva di CRP USA nel mercato aerospaziale statunitense, e contribuisce a migliorare i processi di qualità all'interno della nostra organizzazione. Inoltre, dimostra il nostro impegno continuo per fornire ai nostri clienti un servizio di AM sempre più efficiente ed avanzato".

AS9100 viene considerato all'unanimità un programma condiviso di cooperazione mondiale (trova infatti applicazione negli Stati Uniti, Europa, Asia), e tutte le principali aziende del settore aeronautico si sono orientate verso tale norma, considerandola sempre più un requisito indispensabile per garantire sicurezza e qualità.





**Press Office Manager**  
**Veronica Negrelli**  
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October 2020

3D Printing Creative



Home > Settori verticali > Medicale > DPI stampati in 3D: supporti per visiere protettive

## DPI stampati in 3D: supporti per visiere protettive

23 Ottobre 2020



Mediante il processo di sinterizzazione laser selettiva e il materiale a base poliammidica Windform FX Black, Crp Technology ha realizzato per Tecnoguarnizioni l'archetto di due DPI utilizzabili in qualsiasi ambito professionale e in presidi medici e ospedalieri.

La velocità di esecuzione e la funzionalità dei pezzi in Windform hanno permesso ai dispositivi di essere certificati in breve tempo

**Tecnoguarnizioni s.a.s** è un'azienda italiana con sede a Soliera, Modena, che da oltre 40 anni produce guarnizioni piane industriali.

In questo periodo di crisi sanitaria ha deciso di contribuire attivamente alla lotta contro il Covid-19



## The Additive Journal



### La stampa 3D nella costruzione di strutture nano-satellitari

23 Views · CRP Technology, Materiali, PocketQube Workshop, stampa3D

CRP Technology sarà tra i relatori ed espositori virtuali del PocketQube Workshop, la due giorni di eventi organizzata da Alba Orbital sul tema dei picosatelliti (tipologia di satelliti miniaturizzati). L'edizione 2020 si terrà online l'8 e il 9 ottobre.

E proprio nel giorno di apertura, sulla piattaforma Zoom e a partire dalle ore 17:50 (CEST), CRP Technology presenterà l'intervento: "Composite Additive Materials for NanoSats' manufacturing". L'ingegnere Franco Cevolini, Direttore Tecnico e Vice Presidente di CRP Technology, commenta: "Negli ultimi anni la tecnologia della stampa 3D professionale ha raggiunto nuove vette grazie al suo utilizzo sempre più massiccio nella realizzazione di componenti portanti per strutture spaziali. Risultati unici si sono ottenuti soprattutto nel campo dei micro e mini-satelliti, dove l'uso dei materiali compositi ad alte prestazioni, come i nostri Windform® TOP-LINE, uniti alla stampa 3D, sta facendo la differenza".

#### I contenuti dell'intervento

L'intervento di CRP Technology verterà sui vantaggi dell'utilizzo della stampa 3D professionale e materiali compositi rinforzati fibra di carbonio o vetro nella costruzione di strutture nano-satellitari. Verrà inoltre condivisa una panoramica sulle missioni spaziali che hanno segnato una pietra miliare nell'arena dei micro-satelliti, come la costruzione di Alba Pod V2, un sistema di rilascio per picosatelliti di Alba Orbital. CRP Technology l'ha realizzato nel materiale caricato fibra di carbonio Windform® XT 2.0 attraverso la tecnologia della sinterizzazione laser selettiva.

Il link per registrarsi al workshop è [www.pocketqubeworkshop.com/registration](http://www.pocketqubeworkshop.com/registration)

Post correlato: <https://publiteconline.it/additivejournal/2020/09/29/as9100/>



## JEC Composites



# CRP USA achieves AS9100 Rev. D certification

International

French

5 OCT 2020

The certification signifies CRP USA operates a Quality Management System that complies with the requirements of ISO 9001:2015 + IAQG Requirements.

CRP USA, pioneering company in the fields of Additive Manufacturing and high performance composite materials, announced it has recently achieved AS9100 Rev. D certification for the manufacture of 3D printed aerospace products from its customer's component design data.

AS9100 Rev. D certification signifies CRP USA's ongoing commitment to meeting and exceeding increasingly stringent industry requirements for aerospace related products.

Stewart Davis, Director of Operations, CRP USA.says:

*"We have taken our expertise in Additive Manufacturing solutions to new heights to produce parts for the most demanding sectors as Aerospace and Defense. Our team is working alongside key space industry leaders, supplying value-added high-performance 3D printed products to meet their needs. AS9100 Rev.D certification reflects our dedication to achieving the highest standard of customer satisfaction; moreover, it is a further demonstration of the effectiveness of additive manufacturing and use of Windform as structural materials for space and aerospace applications."*

AS9100 is the international Quality Management System standard for the Aviation, Space and Defense (AS&D) industry, created by the IAQG (the International Aerospace Quality Group). AS9100 Rev D (2016) is the most recent version. It specifies requirements for a quality management system where an organization wishes to demonstrate its ability to consistently provide product that meets ASD customer and applicable statutory and regulatory requirements.

**More information:**

[WWW.CRP-USA.NET](http://WWW.CRP-USA.NET)

Business



## Portale Compositi



CRP Technology e i materiali compositi per i nano-satelliti

L'azienda sarà tra i relatori ed espositori virtuali del PocketQube Workshop, la due giorni di eventi organizzata da Alba Orbital

Tempo stimato  
di lettura 43 sec



CRP Technology sarà tra i relatori ed espositori virtuali del PocketQube Workshop, la due giorni di eventi organizzata da Alba Orbital sul tema dei picosatelliti (tipologia di satelliti miniaturizzati).



L'edizione 2020 si terrà online l'8 e il 9 ottobre.



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Il link per registrarsi al workshop è [qui](#)



## Composites Portal



AEROSPACE

### Composite materials for NanoSats' manufacturing

*CRP Technology will be attending for the first time Alba Orbital's PocketQube Workshop 2020 as speaker and virtual exhibitor*

Estimated time of reading 40 sec



CRP Technology will be attending for the first time Alba Orbital's PocketQube Workshop 2020 as speaker and virtual exhibitor.



The 2020 edition will be held online from the 8th to 9th of October 2020.



On Oct 8th, over Zoom cloud platform, starting at 16:50 to 17:10 (BST), CRP Technology will be presenting the paper: "Composite Additive Materials for NanoSats' manufacturing".

Engineer Franco Cevolini, CTO and VP CRP Technology comments: "In the last few years 3D printing technology has reached new heights with the manufacture of structural components for the new generation of Space parts and structures. The uniqueness results have been obtained especially in the field of PocketQubes and CubeSats by using high performance composite materials, as our Windform TOP-LINE family."

The paper will be highlighting the challenges related to making nanosatellite missions successful.

Here the registration [link](#)



## Konstruktions Praxis

# konstruktions praxis

Startseite > Entwicklung > Formgebung > Additiv gefertigter Minisatellit ist bereit für Tests im Weltraum

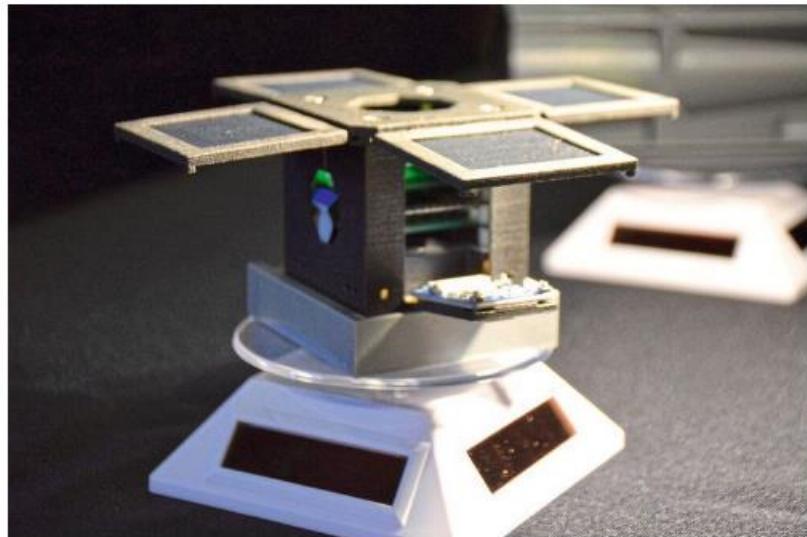


Prototyp

## Additiv gefertigter Minisatellit ist bereit für Tests im Weltraum

08.10.2020 | Redakteur: [Dorothee Quitter](#)

CRP hat vollständige funktionale Prototypen von Kleinsatelliten unter Verwendung eines mit Kohlenfaser verstärkten Verbundwerkstoffs im Lasersintern hergestellt.



*Die gesamte Struktur und einige Komponenten des Kleinsatelliten Discovery 1a wurden aus dem CFK-Pulver Windform XT 2.0 additiv hergestellt.  
(Bild: CRP)*

Das Unternehmen Mini-Cubes wurde 2008 von Joseph Latrell mit dem Ziel gegründet, einen besonders kleinen Satelliten mit einer Größe von etwa 5 cm<sup>3</sup> und einem Gewicht von höchstens 250 g zu entwickeln. Dieser Pocket-Qube soll eine Alternative zum Cube-Sat sein, dessen Freisetzungen in die Umlaufbahn immer kostspieliger werden.

### Das Projekt

Vor kurzem haben Latrell und sein Team ein Engineering-Projekt für einen neuen, weltraumtauglichen 1P-Pocket-Qube mit dem Namen Discovery 1a gestartet. Ziel des Projekts ist es, eine ganze Serie von Pocket-Qube-Satelliten in additiver Fertigung herzustellen. Die Satelliten sollen zur Überwachung der Wasserressourcen eingesetzt werden.

Für die Herstellung dieses Kleinsatelliten hat sich Mini-Cubes an CRP USA gewandt, um



## Composites World



### CRP USA achieves AS9100 Rev. D certification

The certification enables CRP's manufacture of 3D-printed aerospace products from its customer's component design data.



EDITED BY **GRACE NEHLS**  
Assistant Editor, CompositesWorld

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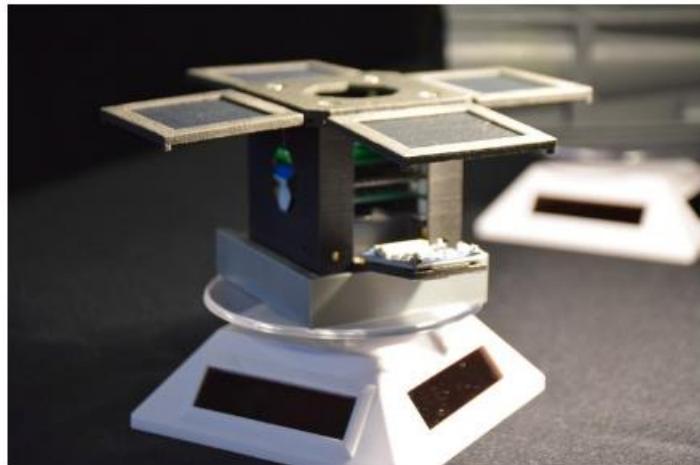
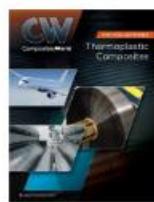


Photo Credit: Mini-Cubes

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#### CW COLLECTIONS



Download CW's Thermoplastic Composites Collection

CRP USA (Mooresville, N.C., U.S.), additive manufacturing and high-performance composite materials company, announced that it has recently achieved AS9100 Rev. D certification for the manufacture of 3D-printed aerospace products from its customer's component design data. AS9100 is the international Quality Management System standard for the aviation, space and defense (AS&D) industry, created by the IAQG (the International Aerospace Quality Group; Brussels, Belgium) and is said to signify CRP USA's ongoing commitment to meeting and exceeding increasingly stringent industry requirements for aerospace related products.

"We have taken our expertise in additive manufacturing solutions to new heights to produce parts for the most demanding sectors as aerospace and defense," says Stewart Davis, director of Operations, CRP USA. "Our team is working alongside key space industry leaders, supplying value-added high-performance 3D-printed products to meet their needs. AS9100 Rev. D certification reflects our dedication to achieving the highest standard of customer satisfaction; moreover, it is a further demonstration of the effectiveness of additive manufacturing and use of Windform as structural materials for space and aerospace applications."



## Elektronikpraxis

ELEKTRONIK  
**PRAXIS**

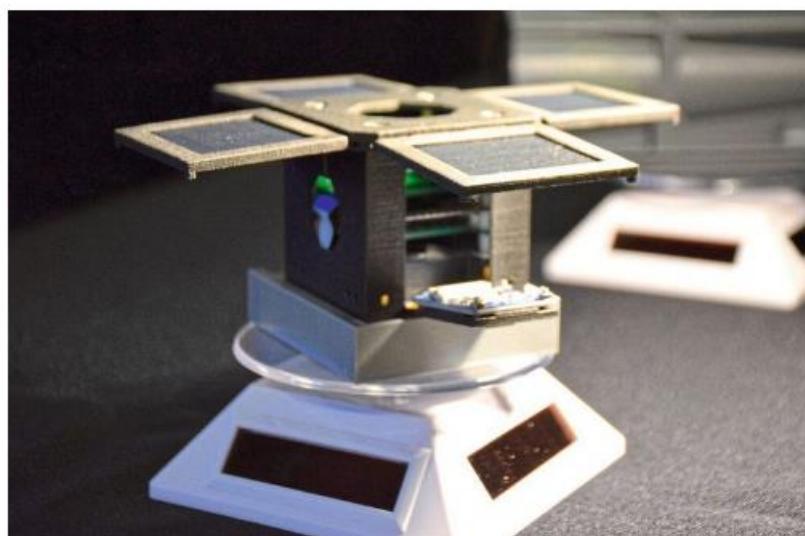
Startseite > Technologie > Forschung & Science > Additiv gefertigter Minisatellit ist bereit für Tests im Weltraum



# Additiv gefertigter Minisatellit ist bereit für Tests im Weltraum

18.10.2020 | Redakteur: Dorothee Quitter

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Für die Herstellung dieses Kleinsatelliten hat sich Mini-Cubes an CRP USA gewandt, um die gesamte Struktur und einige Komponenten additiv zu fertigen. CRP USA, die US-Tochtergesellschaft von CRP Technology, bietet innovative Lösungen im selektiven



## Additive Manufacturing AMazing

# ADDITIVE MANUFACTURING **AMazing®**

+ OCTOBER 20, 2020

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### 3D Printed Visor Frame for Made in Italy Protective Face Shields

Through selective laser sintering process and Windform® FX BLACK polyamide-based material, CRP Technology has manufactured for Tecnoguarnizioni the visor frame of two PPE for medics and professionals.

The speed of execution and the functionality of the parts in Windform® allowed the devices to be certified in a short time

Tecnoguarnizioni s.a.s (Soliera, Modena, Italy) for over 40 years has been producing industrial flat gaskets of all sizes based on the customer's design. In this period of major global crisis and health emergency, it is actively contributing to the fight against Covid-19 by creating new personal protective equipment (PPE).

Tecnoguarnizioni's project consisted in the creation of two polycarbonate protective face shields models: one version (named Safe4U) for working environments; the other one (Safe4U +) to meet the requirement of the CE Mark for medical devices. Both face protectors are equipped with a visor frame which, fastener to a rubber band, allows to wear the PPE while keeping your hands free to perform any action.



Photo courtesy of Tecnoguarnizioni s.a.s

For the manufacture of the visor frame, Tecnoguarnizioni turned to CRP Technology and its technological solutions that combine speed of execution and optimal performance. The Soliera-based company needed to obtain quickly the functional prototypes of the visor frames, in order to submit as soon as possible the final device to the CE certification process, and to finalize definitively the injection mold for industrial production, to avoid changes which would have involved huge waste of time and money.



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**PRESS RELEASES**

## 3D printed visor frame for Made in Italy protective face shields

By [Press Releases](#) - Oct 22, 2020



**Through selective laser sintering process and Windform® FX BLACK polyamide-based material, CRP Technology has manufactured for Tecnoguarnizioni the visor frame of two PPE for medics and professionals. The speed of execution and the functionality of the parts in Windform® allowed the devices to be certified in a short time**

Tecnoguarnizioni s.a.s (Soliera, Modena, Italy) for over 40 years has been producing industrial flat gaskets of all sizes based on the customer's design.

In this period of major global crisis and health emergency, it is actively contributing to the fight against Covid-19 by creating new personal protective equipment (PPE).

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Visor frames have been manufactured using Selective Laser Sintering process and Windform® FX BLACK, a new generation polyamide based material with a dark black color from Windform TOP-LINE range SLS materials. It is characterized by exceptional resistance to repeated bending and torsion. The material shows excellent impact



## Industrial Laser Solutions



HOME | ADDITIVE MANUFACTURING

### Selective laser sintering process produces 3D-printed visor frame

The visor frames were made using an additive manufacturing method and a new polyamide-based material with a dark black color.

Author — David Belforte

Oct 23rd, 2020



For over 40 years, Tecnoguarnizioni s.a.s (Soliera, Modena, Italy) has been producing industrial flat gaskets of all sizes based on the customer's design. Now, the company is actively **contributing to the fight against COVID-19 by creating new personal protective equipment (PPE)**.



The company's project was the creation of two polycarbonate protective face shield models: one version for working environments and the other to meet the requirement of the CE Mark for medical devices. Both face protectors are equipped with a visor frame that, fastened to a rubber band, allows the user to wear the PPE while keeping their hands free to perform any action.

To manufacture the visor frame, Tecnoguarnizioni turned to CRP Technology (Modena), whose technological solutions combine speed of execution and optimal performance. The company needed to quickly obtain functional prototypes of the visor frames in order to submit the final device to the CE certification process as soon as possible, and to finalize definitively the injection mold for industrial production to avoid changes that would have involved a huge waste of time and money.

Visor frames were manufactured using the selective laser sintering (SLS) process and Windform FX BLACK, a polyamide-based material with a dark black color from **Windform's TOPLINE range of SLS materials**. It is characterized with exceptional resistance to repeated bending and torsion. The material shows excellent impact resistance, even at low temperatures.

Once completed, the visor frames were hand-finished by CRP Technology's specialized workers, to simulate as much as possible the finish of the injection molding. This was possible thanks to the characteristics of Windform FX BLACK, whose consistency and behavior are similar to polypropylene and ABS injection-molded parts. The 3D-printed visor frames in Windform FX BLACK were attached to



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**Selective laser sintering manufactures control system component**

David Belforte Sep 18th, 2020





## In Fiera



INITIVE MANUFACTURING - Materiali

# La stampa 3D per la produzione di nano-satelliti

di Alberto Marelli



CRP USA, l'azienda statunitense partner dell'italiana

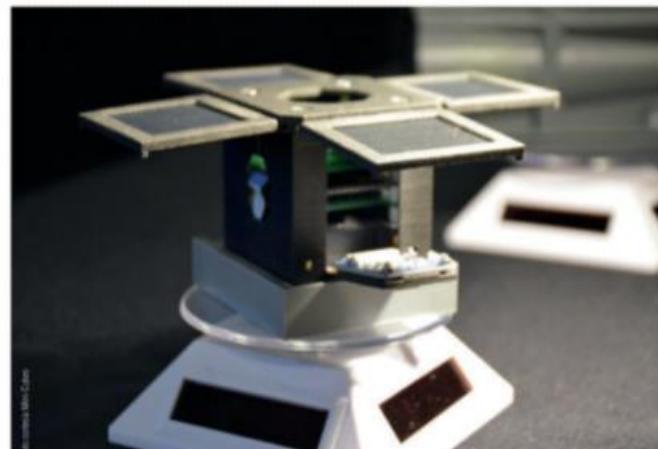
CRP Technology, ha costruito tre modelli di pico-satelliti per la società Mini-Cubes. Si tratta della fase 1 di un ampio progetto volto alla realizzazione di un intero sciame di nano-satelliti in stampa 3D professionale per il monitoraggio delle risorse idriche della terra.

Per la prima volta interi prototipi funzionali di 1P PocketQube pronti per l'impiego nello spazio sono stati realizzati utilizzando un materiale composito rinforzato fibra di carbonio - il Windform® XT 2.0 - e il processo di sinterizzazione laser selettiva.

L'azienda statunitense Mini-Cubes è stata fondata nel 2008 da Joseph Larelli per rendere i PocketQube - tipologia di nano-satelliti molto piccoli con una dimensione di circa 5 cm³ e con una massa che non supera i 250 grammi - una valida e praticabile alternativa ai CubeSat, i cui lanci in orbita stanno diventando sempre più costosi.

### Satelliti per il monitoraggio delle risorse idriche della terra

Recentemente Joe Larelli e il suo team hanno avviato un progetto di ingegnerizzazione di un



PocketQube "Discovery 1a" in esposizione al PocketQube workshop di Glasgow, terza edizione. Progettato dall'azienda statunitense Mini-Cubes, Discovery 1a è stato costruito da CRP USA utilizzando il processo di sinterizzazione laser selettiva e il materiale composito rinforzato fibra di Carbonio Windform® XT 2.0.

nuovo 1P PocketQube pronto per l'impiego nello spazio, chiamato Discovery 1a.

Per la costruzione di questo pico-satellite, Larelli si è rivolto a CRP USA affinché l'intera struttura e alcuni componenti venissero realizzati in Additive Manufacturing.

CRP USA, consociata statunitense di CRP Technology, nel corso dell'ultimo quindicennio ha sviluppato una notevole esperienza nel campo, fornendo ai key-leader del settore aerospaziale soluzioni all'avanguardia utilizzando il processo di sinterizzazione laser e i materiali compositi Windform® TOP-LINE, creati da CRP Technology.

Lo scopo del progetto di Larelli è arrivare a costruire in Additive Manufacturing un'intera costellazione (o sciame) di satelliti PocketQube per il monitoraggio delle risorse idriche della terra.

"Da tempo - spiega lo stesso Larelli - sono un accanito fan della stampa 3D professionale, che ho avuto occasione di sperimentare diversi anni fa quando lavoravo per un'azienda impegnata nel settore aerospaziale; all'epoca feci costruire in stampa 3D le alette di un razzo.

Quando abbiamo iniziato a lavorare all'ingegnerizzazione del Discovery, sapevo che volevo "superare ogni confine", dal fattore di forma



Tecn'è LAB

TECNELAB

## Con Windform® XT 2.0 e la tecnologia CRP si realizzano anche componenti per macchine controllo qualità

0 22/10/2020 300 volta/e

Condividi Articolo



La scatola di contenimento sensore IMAL in stampa 3D e Windform® XT 2.0. Da sinistra: guscio anteriore (esterno), guscio posteriore (interno). Nella foto di anteprima: la scatola di contenimento sensore IMAL realizzata da CRP Technology in stampa 3D e materiale composito Windform® XT 2.0.

IMAL, azienda leader nella realizzazione di macchinari per la produzione di pannello truciolare compensato, MDF e OSB, ha realizzato per un importante cliente una macchina controllo qualità da porre a fine ciclo produttivo, basata sulla tecnologia al TeraHertz onde millimetriche (T-ray).

Per la realizzazione della scatola di contenimento del sensore della macchina, IMAL ha deciso – per la prima volta – di non affidarsi a scatole commerciali, in quanto non avrebbero soddisfatto i criteri di qualità aziendali, ma alle soluzioni in stampa 3D fornite da CRP Technology.

L'applicazione doveva essere realizzata in tempi ridotti, e coniugare elevate prestazioni meccaniche – resistenza ad accelerazioni, sollecitazioni e velocità sostenuta – ad altrettanti elevati standard estetici.

L'attività del reparto Stampa 3D di CRP Technology è stata fin dall'inizio improntata alla massimizzazione e al raggiungimento degli obiettivi richiesti. Il lavoro è partito da un'attenta analisi dei disegni tridimensionali ricevuti da IMAL.

Grazie al know-how acquisito in oltre 25 anni di attività a servizio dei settori industriali più esigenti e performanti, CRP Technology ha potuto assistere IMAL nella scelta della tecnologia e del materiale migliore per la riuscita del progetto: la sinterizzazione laser selettiva e il materiale composito Windform® XT 2.0, che appartiene alla gamma Windform® TOP-LINE, ideata e creata dalla stessa CRP Technology.

Windform® XT 2.0 è un materiale composito a base poliammidica caricato con fibre di carbonio, famoso tra i professionisti della stampa 3D per le sue caratteristiche meccaniche. È particolarmente adatto per applicazioni ad alta prestazione proprie di settori come il motorsport, l'avionario, l'aerospaziale e UAV.

Windform® XT 2.0 sostituisce la formula precedente del Windform® XT, con miglioramenti nelle proprietà meccaniche di assoluto rilievo: +8% sul carico di rottura, +22% sul modulo elastico e +46% sull'allungamento alla rottura.

In questo caso specifico, la scelta del materiale si è rivelata ancora più appropriata: il carbonio con cui è caricato il Windform® XT 2.0 ha infatti garantito alla scatola una schermatura dal punto di vista elettromagnetico. Un plus ritenuto molto importante da IMAL.

"Ci siamo rivolti a CRP Technology", spiegano in IMAL, "perché sapevamo che ci avrebbe supportato



## Aerospace Manufacturing

# AEROSPACE MANUFACTURING



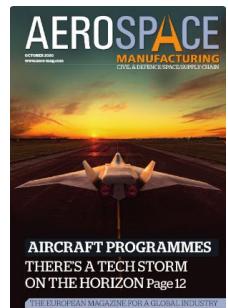
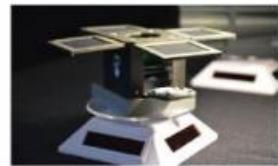
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[www.crp-usa.net](http://www.crp-usa.net)







**Press Office Manager**  
**Veronica Negrelli**  
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**November 2020**

Stampare in 3D

## STAMPARE IN 3D

LE ULTIME NOVITÀ DAL MONDO DELLA STAMPA 3D

**CRP Technology e Alba Orbital pronti al maxi lancio di nove satelliti PocketQube nel suo deployer AlbaPod v2**



POSTED BY: FANTASY NOVEMBRE 26, 2020

LA TECNOLOGIA CRP E ALBA ORBITAL SI PREPARANO PER IL PIÙ GRANDE LANCIO DI POCKETQUBE FINO AD OGGI

Con l'aiuto del fornitore di materiali e servizi di stampa 3D CRP Technology, l'azienda aerospaziale Alba Orbital ha integrato con successo nove satelliti PocketQube nel suo deployer AlbaPod v2 prima della data di lancio della sua missione Cluster 3 a dicembre.

AlbaPod v2 è attualmente l'unico deployer PocketQube collaudato nello spazio ed è interamente stampato in 3D con il materiale composito ad alte prestazioni Windform XT 2.0 di CRP Technology.

"Siamo molto lieti che la missione Alba Cluster 3 rappresenti un evento storico nella storia di PocketQube e che la stampa 3D professionale insieme al materiale composito Windform XT 2.0 ne faccia parte", ha affermato Franco Cevolini, VP e CTO di CRP Technology. "Abbiamo rivoluzionato



SatMagazine



Photo of a 3D printed AlbaPod 2.0 on a vibration table going through preflight certification. Image is courtesy of Alba Orbital.

## Innovation: 3D Printed Smallsat Deployer

By Matteo Levoni Bemposta, Engineer, Head of Reverse Engineering, CRP Technology

**As tiny and reliable emerging satellites, PocketQubes are "an exemplar of New Space research and innovation."**

The original idea came from Professor Robert J. Twiggs from [Morehead State University](#) (MSU) who proposed the standard of "a satellite that fits in your pocket." Indeed, a PocketQube is a type of miniaturized satellite for space research that usually has a size of 5 cm cubed (one eighth the volume of a cubesat), has a mass of no more than 250 grams and typically uses Commercial-Off-The-Shelf (COTS) components for its electronics.

This type of satellite is quite young — started in 2009 — but their importance is increasing at warp speed as a solution to the rising costs of cubesat launches to Low Earth Orbit (LEO). Since their debut, interest for PocketQubes has increased within the space industry.

The first PocketQube Standard was issued in June of 2018 and provided a shared platform to the PocketQubes community; one of the contributors (along with [GAUSS Srl](#), [TU Delft](#)) is [Alba Orbital](#), a fast growing, high-tech, SME based in Glasgow, Scotland.

Alba Orbital provided a hub of support for the class of PocketQube satellites by building their own platforms as well as providing parts and launches to companies, universities and space agencies around the world.

### Challenge

Recently, Alba Orbital needed to build an updated version of their PocketQube satellite deployer, [AlbaPod 2.0](#). The aims of the project were to improve on previous designs in terms of weight, manufacturability, access and the incorporation of a number of safety features.

Alba Orbital turned to [CRP Technology](#) for the manufacturing of the deployer, as the Italian-based, 3D printing company already had considerable experience supplying cutting-edge solutions for key industry leaders using their patented [Windform® TOP-LINE composite](#).



AlbaPod 2.0.



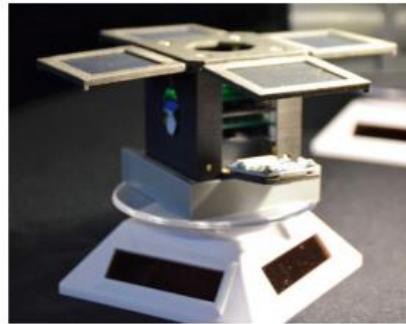
## MM Maschinen Markt



SPECIAL | Additive Fertigung

# AB INS WELTALL

CRP USA hat drei von Mini-Cubes entworfene Modelle von Kleinsatelliten gebaut. Es ist das erste Mal, dass vollständig funktionale Prototypen von 1P PocketQubes unter Verwendung eines mit Kohlenfaser verstärkten Verbundwerkstoff und des selektiven Lasersinterverfahrens hergestellt wurden.



Der vom amerikanischen Unternehmen Mini-Cubes entwickelte Discovery 1a wurde von CRP USA unter Verwendung des selektiven Lasersinterverfahrens und des mit Kohlenfaser verstärkten Verbundwerkstoffes Windform XT 2.0 hergestellt.

**D**as Unternehmen Mini-Cubes wurde 2008 von Joseph Latrell mit dem Ziel gegründet, den PocketQube – einen besonders kleinen Kleinsatelliten mit einer Größe von etwa fünf Kubikzentimetern und einem Gewicht von höchstens 250 Gramm – zu einer vernünftigen Alternative zum CubeSat, dessen Freisetzungen in die Umlaufbahn immer kostspieliger werden, werden zu lassen.

**Das Projekt.** Für die Herstellung dieses Kleinsatelliten hat sich der Firmengründer Joe Latrell an CRP USA gewandt, um die gesamte Struktur und einige Komponenten des Satelliten mittels Additiver Fertigung zu bauen. CRP USA, die US-Tochtergesellschaft von CRP Technology, hat weitreichende Erfahrungen auf diesem Gebiet und bereits innovative Lösungen unter Verwendung des Lasersinterverfahrens und der von CRP Technology entwickelten Verbundwerkstoffe Windform Top-Line auf den Markt gebracht. Ziel des Projekts von Latrell ist es, die PocketQube-Satelliten zur Überwachung der Wasserressourcen mittels Additiver Fertigung herzustellen.

„Ich bin schon seit Langem ein begeisterter Anhänger des professionellen 3D-Drucks“, erklärt Latrell. „Als wir anfingen, an der Entwicklung des Discovery zu arbeiten wusste ich, dass ich neue

Grenzen überschreiten wollte“, ergänzt er. „Angefangen bei der Form des Satelliten, der so klein wie der PocketQube ist, bis hin zur Technologie für seine Herstellung.“

**Die Herausforderung.** Angesichts einer dermaßen kleinen Struktur stand die größte Herausforderung darin, die Elektronik, die Kamera und das Funksystem im Inneren des Kleinsatelliten anzupassen. Latrell fährt fort: „Der Discovery 1a gehört zur PocketQube-Familie, bei der es sich um sehr kompakte Kleinsatelliten mit einem Innenvolumen von 50 mm x 50 mm x 50 mm handelt.“ Die Aufgabe war nicht einfach: Die mit Windform herzustellenden Teile des Kleinsatelliten Discovery waren entscheidend für den Erfolg des gesamten Projekts.

Der Ausfall eines einzigen, winzigen Bauteils hätte den Ausfall des gesamten Satelliten zur Folge. „Das Projekt, das Latrell uns vorgelegt hat, war einzigartig“, so Stewart Davis, COO von CRP USA, und fährt fort: „Dank unseres Fachwissens konnte es schließlich umgesetzt werden.“

Für die Herstellung des Discovery 1a entschieden sich die Macher für den mit Kohlenfaser verstärkten Verbundwerkstoff Windform XT 2.0. „Die Kombination aus Festigkeit und einfacher Anwendung hat uns sofort überzeugt“, so die Experten. Windform XT 2.0 ist ein Material der neuen Generation. Es zeichnet sich durch deutliche Verbesserungen der mechanischen Eigenschaften aus, darunter +8 % bei der Bruchlast, +22 % beim Elastizitätsmodul und +46 % bei der Bruchdehnung.



Montagetest der elektronischen Platine im Discovery 1a aus Windform XT 2.0.

**Das Ergebnis.** CRP USA hat für Mini-Cubes drei funktionale Prototypen des 1P PocketQube hergestellt: zwei für Tests und einen für den Flug in die Umlaufbahn. Das Lasersinterverfahren in Kombination mit dem kohlenfaserverstärkten Verbundwerkstoff Windform XT 2.0 erwies sich als die beste Wahl: alle drei 1P PocketQube haben erfolgreich die Tests bestanden und die Standards von Mini-Cubes vollständig erfüllt. \*

[www.crp-usa.net](http://www.crp-usa.net), [www.windform.com](http://www.windform.com)



Costruire Stampi

# Costruire stampi

The ADDITIVE JOURNAL

## COMPONENTI FUNZIONANTI PER MACCHINE CONTROLLO QUALITÀ



Commissionata dall'azienda IMAL, la scatola di contenimento del sensore per macchine controllo qualità è stata interamente creata in stampa 3D da CRP Technology e rifinita con lavorazioni meccaniche di precisione a CNC da CRP Meccanica.

di Giovanni Sensini

IMAL, azienda attiva nella realizzazione di macchinari per la produzione di pannello truciolare, compensato, MDF e OSB, ha realizzato per un importante cliente una macchina controllo qualità da porre a fine ciclo produttivo, basata su tecnologia al TeraHertz/onde millimetriche (T-ray).

Per la realizzazione della scatola di contenimento del sensore della macchina, IMAL ha deciso - per la prima volta - di non affidarsi a scatole commerciali, in quanto non avrebbero soddisfatto i criteri di qualità aziendali, ma

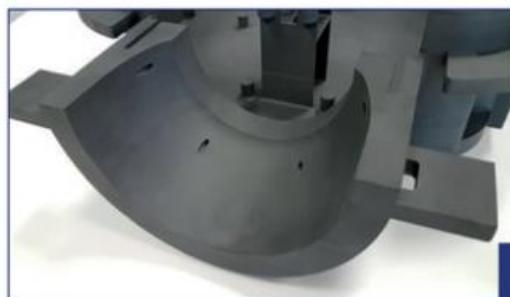


LA SCATOLA DI CONTENIMENTO SENSORE IMAL REALIZZATA DA CRP TECHNOLOGY IN STAMPA 3D E MATERIALE COMPOSTO Windform® XT 2.0.

alle soluzioni in stampa 3D fornite da CRP Technology. L'applicazione doveva essere realizzata in tempi ridotti, e conjugare elevate prestazioni meccaniche (resistenza ad accelerazioni, sollecitazioni e velocità sostenuta) ad altrettanti elevati standard estetici.

**PER APPLICAZIONI AD ALTE PRESTAZIONI**  
L'attività del reparto Stampa 3D di CRP Technology è stata fin dall'inizio improntata alla massimizzazione e al raggiungimento degli obiettivi richiesti.  
Il lavoro è partito da un'attenta analisi dei disegni tridi-

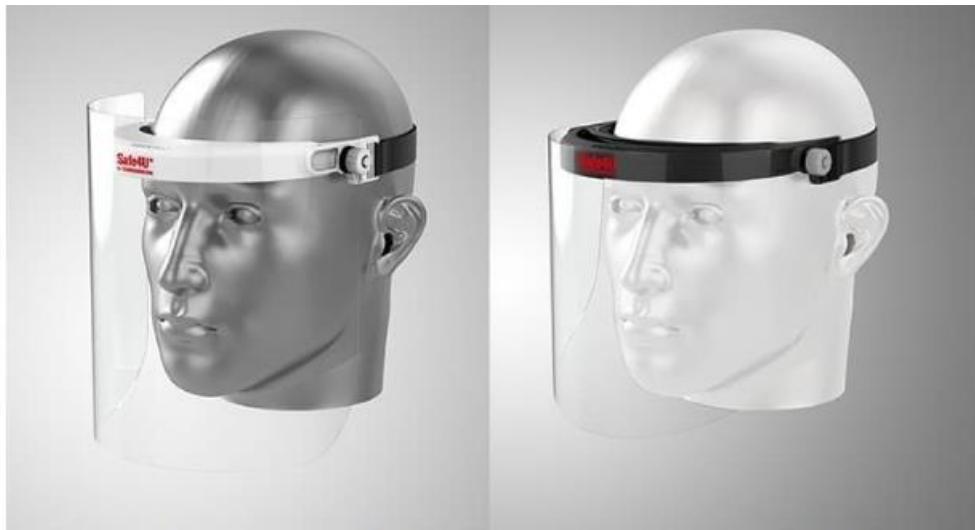
DETALLO DELLA SCATOLA DI CONTENIMENTO SENSORE IMAL REALIZZATA DA CRP TECHNOLOGY.





## Today's Medical Developments

# TODAY'S MEDICAL DEVELOPMENTS



(Left) Tecnoguarnizioni PPE, Safe4U protective face shield (black). The functional prototypes of the visor frame were made by CRP Technology using selective laser sintering and Windform FX BLACK polyamide-based material. (Right) 2.Tecnoguarnizioni PPE, Safe4U+ protective face shield (white). The functional prototypes of the visor frame were made by CRP Technology using selective laser sintering and Windform FX BLACK polyamide-based material.  
Courtesy Tecnoguarnizioni

### CRP Technology manufactures 3D printed visor frame

Made in Italy protective face shields produced through selective laser sintering process and Windform FX BLACK polyamide-based material.

November 10, 2020



Posted by Elizabeth Engler Modic



Design/Engineering

Tecnoguarnizioni s.a.s (Soliera, Modena, Italy) for more than 40 years has been producing industrial flat gaskets of all sizes based on the customer's design.

In this period of major global crisis and health emergency, it is actively contributing to the fight against COVID-19 by creating new personal protective equipment (PPE).

#### The project

Tecnoguarnizioni's project consisted in the creation of two polycarbonate protective face shields models: one version (named Safe4U) for working environments; the other one (Safe4U+) to meet the requirement of the CE Mark for medical devices.

Both face protectors are equipped with a visor frame which, fastener to a rubber band, allows to wear the PPE while keeping your hands free to perform any action.

For the manufacture of the visor frame, Tecnoguarnizioni turned to CRP Technology and its technological solutions that combine speed of execution and optimal performance.

The Soliera-based company needed to obtain quickly the functional prototypes of the visor frames, in order to submit as soon as possible the final device to the CE certification process, and to finalize definitively the injection mold for industrial production, to avoid changes which would have involved huge



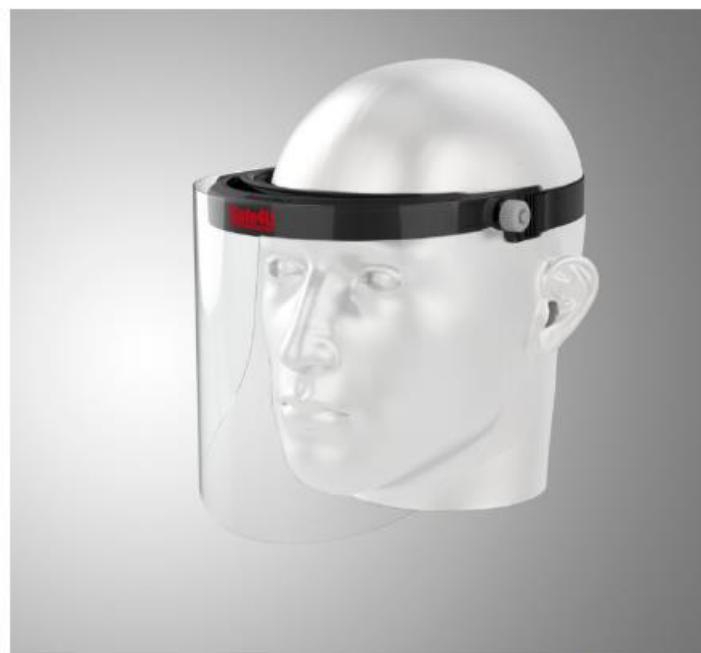
Il Progettista Industriale

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[Home](#) > [Argomenti](#) > [Supporti per visiere protettive in stampa 3D e Windform FX Black](#)

## Supporti per visiere protettive in stampa 3D e Windform FX Black

Riccardo Fioretto 20/10/2020



Dispositivo di protezione individuale Safe4U+ (bianco) di Tecnoguarnizioni. I prototipi funzionali dell'archetto sono stati realizzati da CRP Technology in sinterizzazione laser selettiva e usando il materiale a base poliammidica Windform FX Black.

Supporti per visiere protettive made in Italy in stampa 3D e Windform: attraverso il processo di sinterizzazione laser selettiva e il materiale a base poliammidica Windform FX Black, **CRP Technology** ha realizzato per Tecnoguarnizioni l'erchetto di due DPI utilizzabili in qualsiasi ambito professionale e in presidi medici e ospedalieri. La velocità di esecuzione e la funzionalità dei pezzi in Windform hanno permesso ai dispositivi di essere certificati in breve tempo.

Tecnoguarnizioni è un'azienda italiana con sede a Soliera, Modena, che da oltre 40 anni produce guarnizioni piane industriali. In questo periodo di crisi sanitaria ha deciso di contribuire attivamente alla lotta contro il Covid-19 realizzando nuovi dispositivi di protezione individuale (DPI). "Ci siamo rimboccati le maniche andando incontro alle esigenze comuni,



DPI Safe4U: Dettaglio del pomello laterale per il fissaggio e la regolamentazione della durezza del



## Compositi Magazine



### Windform® 3D printed visor frame for Made in Italy protective face shields

Pubblicato il 20/10/2020

[Tecnoguarnizioni s.a.s](#) (Soliera, Modena, Italy) for over 40 years has been producing **industrial flat gaskets** of all sizes based on the customer's design. In this period of major global crisis and health emergency, it is actively contributing to the **fight against Covid-19** by creating **new personal protective equipment (PPE)**.

#### The project

Tecnoguarnizioni's project consisted in the creation of **two polycarbonate protective face shields models:**

- one version (named **Safe4U**) for working environments
- the other one (**Safe4U +**) to meet the requirement of the CE Mark for medical devices.

Both face protectors are equipped with a **visor frame** which, fastened to a rubber band, allows to wear the PPE while keeping your hands free to perform any action.

For the manufacture of the visor frame, Tecnoguarnizioni turned to [CRP Technology](#) and its technological solutions that combine speed of execution and optimal performance. The Soliera-based company needed to obtain quickly the functional prototypes of the visor frames, in order to submit *as soon as possible* the final device to the CE certification process, and to finalize definitively the injection mold for industrial production, to avoid changes which would have involved huge waste of time and money.

#### More specifically, **Safe4U**

It is a personal eye and face protector, holed visor frame, with adjustable and transparent shield. It protects against high-speed particles, medium energy impact ( 120 m/s ). It has a flip-up and replaceable shield and an easily adjustable elastic band.

#### More specifically, **Safe4U +**

It is a personal eye and face protector, with a bigger, replaceable, flip-up shield and with-no-hole visor frame. It is a **CE certified model** for use in healthcare settings, medical facilities and hospitals, as it is suitable for the mandatory requirement of protection against drops and splashes of liquids. It protects against high-speed particles – low energy impact ( 45 m/s ).

Both protective face shields **comply with the specific requirements** provided for by the connected harmonised standard EN 166:2001 as PPE Cat. 2, Optical class 1. They can be easily disinfected/sterilised and reused.

#### Solution

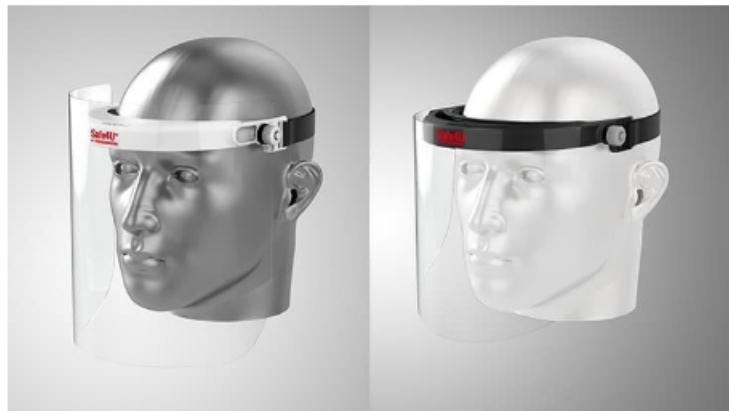
The examination of the 2D and 3D files of the visor frames led the CRP Technology's 3D Printing Department team to identify in **Selective Laser Sintering** and **Windform® FX Black** the manufacturing process and the most suitable material to meet the request of the customer.

"We decided to rely – says **Tecnoguarnizioni CEO, Sandro Righi** – on professional 3D printing



## Today's Motor Vehicle

# Today's **MOTOR** VEHICLES



(Left) Tecnoguarnizioni PPE Safe4U protective face shield (black). The functional prototypes of the visor frame were made by CRP Technology using selective laser sintering and Windform FX BLACK polyamide-based material. (Right) 2Tecnoguarnizioni PPE Safe4U+ protective face shield (white). The functional prototypes of the visor frame were made by CRP Technology using selective laser sintering and Windform FX BLACK polyamide-based material.  
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3Ddayin



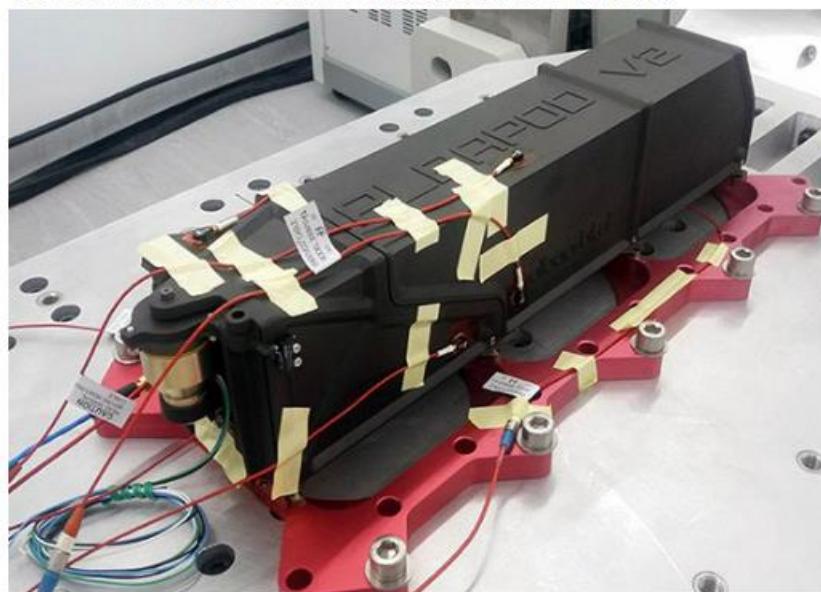
## CRP Technology表示：基于WINDFORM的3D打印口袋卫星已准备就绪

时间：2020-10-15 08:44 来源：中国3D打印网 作者：中国3D打印网 阅读：189次

极光尔沃

中国3D打印网10月15日讯，3D打印材料和服务提供商CRP Technology已部署了其专有的Windform TOP-LINE系列聚合物，为航空航天业的客户制造了一系列纳米卫星和PocketQubes。

该公司的粉末状3D打印材料具有悠久的历史，曾在赛车行业中得到使用，现在正越来越受到具有太空野心的企业的利用。CRP Technology及其合作伙伴CRP USA与航空航天公司Alba Orbital和Mini-Cubes合作，最近利用了Windform XT 2.0增强的热和机械性能，制造了一系列优化的袖珍卫星和部署器。现在，随着Alba Orbital的下一个微型设备三款产品于2020年12月上市，CRP Technology副总裁兼CTO Franco Cevolini解释了在生产中使用Windform的好处。Cevolini解释说：“与许多最初用于航空航天的技术不同，后来又将这些技术应用于赛车运动，Windform XT 2.0是一种纯粹由赛车运动驱动的材料。现在，Windform XT 2.0和所有Windform复合材料已在最先进的行业中用于制造复杂而苛刻的最终零件和功能原型。”



CRP Technology的Windform CT 2.0材料用于3D打印“Albapod v2”的零件（如图）。图片来自Alba Orbital。

### CRP的Windform TOP-LINE材料

CRP成立于1970年，前身是Roberto Cevolini & C，最初的公司主要致力于为一级方程式车队生产专业的汽车零部件和CNC机械零件。该公司后来成为CRP



## JEC Composites



Home > Knowledge > News

### Nine 3D printed PocketQube satellites will be taken to orbit with the upcoming Alba Orbital's space mission

International

French

24 NOV 2020

In December 2020, 9 satellites will be taken to orbit. It will be the largest PocketQube launch in history to date. AlbaPod v2 structure was entirely 3D printed by Italy-based CRP Technology using Windform XT 2.0 high-performance composite material carbon-fiber reinforced. The launch vehicle will be SpaceX Falcon 9.



Nine 3D printed PocketQube satellites will be taken to orbit with the upcoming Alba Orbital's space mission

Alba Orbital Ltd recently announced the successful integration of nine PocketQube satellites ahead of their upcoming Alba Cluster 3 mission, 'That time of year', which will be the largest PocketQube launch in history to date.

Alba Orbital will take customer satellites to orbit on a SpaceX Falcon 9 launch vehicle in December 2020 as part of a rideshare agreement. It will be used the company's AlbaPod v2, the world's only space proven PocketQube deployer. It has been entirely 3D printed by Italy-based CRP Technology using their Windform XT 2.0 high-performance composite material Carbon-fiber reinforced from Windform TOP-LINE family of composite materials.





## Satellite Evolution Group



Satellite Evolution Group · 19 hours ago

# Integration of 9 PocketQube satellites in 3D printed deployer using high-performance composites

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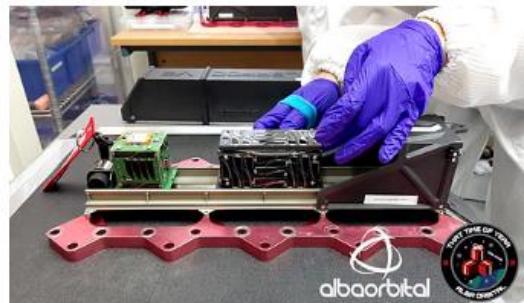
"We are very pleased that Alba Cluster 3 mission represents a historic event in PocketQube history, and that professional 3D printing along with Windform XT 2.0 composite material is part of

it! We revolutionized the small sat arena, and now we are doing the same with the PocketQube world. As Tom Walkinshaw, Founder and CEO Alba Orbital, recently said, "this a huge milestone for Alba and the PocketQube community". We at CRP Technology are very proud of it."

The cluster includes Turkey's first pico-satellite, Grizu-263a which was designed by a team of engineering students from Zonguldak Bülent Ecevit University and named in honour of the 1992 Kozlu coal mine disaster. The Grizu team are joined by other prestigious universities on the Alba Cluster 3 lineup such as TU Delft and Ariel University.

Speaking on why TU Delft signed up to launch with Alba Orbital, Delfi-PQ team member, M. S. (Mehmet) Uludağ said: "Alba Orbital is the only company right now who have a qualified PocketQube Deployer and this gives you a certain confidence that your satellite will be deployed without any problems".

Alba Orbital Cluster 3 is manifested on a SpaceX Falcon 9 launch vehicle and is scheduled for a December 2020 launch date with a target SSO (Polar) Orbit.





## 3D Printing Industry

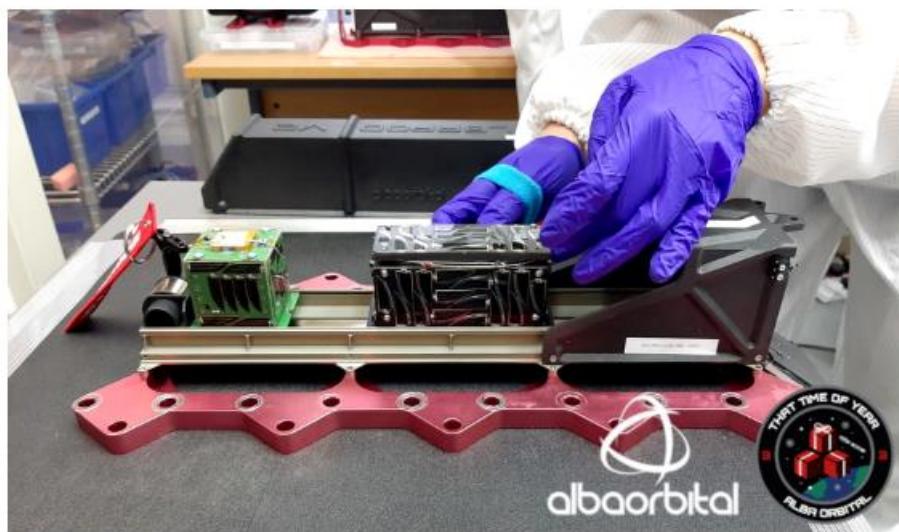


A news article thumbnail from 3D Printing Industry. The title is "CRP TECHNOLOGY AND ALBA ORBITAL GEAR UP FOR LARGEST POCKETQUBE LAUNCH TO DATE". The author is Hayley Everett, and the date is November 26th, 2020, at 10:36 AM. There are 0 comments and 0 likes. A small "AEROSPACE" tag is visible in the top right corner of the thumbnail image.

With the help of 3D printing materials and services provider [CRP Technology](#), aerospace firm [Alba Orbital](#) has successfully integrated nine PocketQube satellites into its AlbaPod v2 deployer ahead of the launch date for its Cluster 3 mission in December.

The AlbaPod v2 is currently the world's only space-proven PocketQube deployer and is entirely [3D printed](#) with CRP Technology's Windform XT 2.0 high-performance composite material.

"We are very pleased that Alba Cluster 3 mission represents a historic event in PocketQube history, and that professional 3D printing along with Windform XT 2.0 composite material is part of it," said Franco Cevolini, VP and CTO at CRP Technology. "We revolutionized the smallsat arena, and now we are doing the same with the PocketQube world. As Tom Walkinshaw, founder and CEO of Alba Orbital, recently said, 'this is a huge milestone for Alba and the PocketQube community.' We at CRP Technology are very proud of it."



Alba Orbital has successfully integrated nine PocketQube satellites into its AlbaPod v2 deployer. Image via CRP Technology.

### The Alba Cluster 3 mission

A PocketQube is a type of miniaturized satellite for space research that usually has



## Manufacturing Tomorrow



### Successful integration of 9 PocketQube satellites in a 3D printed deployer manufactured using high-performance composite material

Visit <http://Crptechnology.com> for further information

The core of the upcoming mission, named 'That time of year', is Alba Orbital's AlbaPod v2, the world's only space proven PocketQube deployer, entirely 3D printed by Italy-based CRP Technology using Windform XT 2.0 high-performance composite material Carbon-fiber reinforced. The deployer will take customer satellites to orbit on a SpaceX Falcon 9 launch vehicle in December 2020. It will be the largest PocketQube launch in history to date.

11/25/20, 06:00 AM | Additive & 3D Printing, Design & Development | CRP Technology

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Rockwell Automation  
Expands Visualization

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## CIM Composites in Manufacturing



# CRP hails 3D printed satellite deployer success

27 NOVEMBER 2020 • In News



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## Portale Compositi



### Stampa 3D e compositi per la missione spaziale dei PocketQube

*La struttura del sistema di rilascio è stata costruita dall'azienda italiana CRP Technology per conto della compagnia scozzese Alba Orbital*

Tempo stimato  
di lettura 1,06 min



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Il gruppo di 9 PocketQube include il primo picosatellite della Turchia, Grizu-263a, progettato da un team di studenti di ingegneria dell'Università Zonguldak Bülent Ecevit e chiamato così in onore del disastro della miniera di carbone di Kozlu risalente al 1992.



## Composites Portal



### 3D printing and composites for the PocketQube space mission

*The world's only space proven PocketQube deployer has been entirely 3D printed by Italy-based CRP Technology*

Estimated time of reading 54 sec



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## Additive Manufacturing AMazing

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+ NOVEMBER 27, 2020

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### Successful Integration of 9 PocketQube Satellites in a 3D Printed Deployer Manufactured Using High-Performance Composite Material

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[Crptechology.com](#), [Windform.com](#)

Source: CRP



## The Additive Journal



### Tecnologia italiana nella missione spaziale

28 Views · CRP Technology, picosatelliti, SLS, stampa 3D

C'è molta tecnologia italiana nella prossima missione spaziale che prevede il lancio in orbita di nove picosatelliti (o PocketQube). La struttura del sistema di rilascio è stata costruita in stampa 3D dall'azienda italiana CRP Technology per conto della compagnia scozzese Alba Orbital.

È stata proprio la PMI high-tech di Glasgow ad annunciare pochi giorni fa il successo dell'integrazione dei picosatelliti in vista dell'imminente missione spaziale Alba Cluster 3, denominata "Quel periodo dell'anno", che rappresenterà – con ben nove satelliti coinvolti – il più grande lancio di PocketQube nella storia fino ad oggi.

#### Utilizzata la sinterizzazione laser selettiva

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## CW Composites World



12/1/2020 | 1 MINUTE READ

# Successful integration of PocketQube satellites in 3D-printed composite deployer

The 3D-printed, composites-based AlbaPod v2 satellite deployer and nine integrated PocketQubes for the Alba Cluster 3 mission enable largest PocketQube launch to date.

#space



EDITED BY **GRACE NEHLS**

Assistant Editor, CompositesWorld

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- CRP Technology revises commercial strategy for Windform materials
- CRP Technology produces composite sensor housing box
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Photo Credit: CRP Technology

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**Alba Orbital Ltd.** (Glasgow, U.K.) recently announced the successful integration of nine PocketQube satellites — miniaturized satellites designed to de-orbit and decay upon re-entry into the earth's atmosphere — with the AlbaPod v2 satellite launcher, which is said to be the world's only space-proven PocketQube deployer, and is entirely 3D printed by **CRP Technology** (Modena, Italy) using its Windform XT 2.0 carbon fiber composite material (see "[Satellite deployer redesign supported by 3D-printed composites](#)").

According to Alba Orbital, the PocketQubes will be applied to the upcoming Alba Cluster 3 mission, termed "That time of year," which will take customer satellites to orbit on a SpaceX Falcon 9 launch vehicle in December 2020 as part of a rideshare agreement. The mission is said to be the largest PocketQube launch to date.

The mission's cluster will include Turkey's first pico-satellite, *Grizu-263a*, which was designed by a team of engineering students from Zonguldak Bülent Ecevit University (Zonguldak) and named in honor of the 1992 Kozlu coal mine disaster. The team's satellite, according to Alba Orbital, will be joined with other



## Fare News (Confindustria)

### FARE News



#### Un pezzo di Crp nella missione spaziale Alba Cluster 3

30/11/2020

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"Siamo molto lieti che la missione Alba Cluster 3 entrerà nella storia dei satelliti PocketQube, e che la stampa 3D professionale insieme al materiale composito Windform XT 2.0 ne sia parte - commenta l'Ingegner Franco Cevolini, Vice Presidente e Direttore Tecnico di CRP Technology, che aggiunge - con i nostri materiali Windform abbiamo rivoluzionato il settore degli smallsat, e ora stiamo facendo lo stesso con il mondo dei PocketQube. Come ha recentemente affermato Tom Walkinshaw, fondatore e CEO di Alba Orbital, "questo lancio rappresenta una pietra miliare per la comunità PocketQube", e noi di CRP Technology ne siamo molto orgogliosi!".

Il gruppo di 9 PocketQube include il primo picosatellite della Turchia, Grizu-263a, progettato da un team di studenti di ingegneria dell'Università Zonguldak Bülent Ecevit e chiamato così in onore del disastro della miniera di carbone di Kozlu risalente al 1992. Al team Grizu si sono unite altre prestigiose università come Ariel University e TU Delft. La missione Alba Cluster 3 è prevista a dicembre 2020 con il razzo vettore Falcon 9 di SpaceX su orbita eliosincrona.



## ARTES ESA



[Home](#) > [News](#) > AlbaPod: the most advanced space-proven pocketqube deployer

### AlbaPod: the most advanced space-proven PocketQube deployer

The AlbaPod – which meets the launch environment requirements of most major launch providers – does just this, and makes it possible for PocketQubes to be integrated on any launch vehicle as part of a ‘rideshare’ mission. In December 2019, the AlbaPod was successfully qualified after deploying six PocketQubes in low earth orbit, via an Electron rocket launch from Mahia, New Zealand.

Barnaby Osborne, Technical Officer of the project at ESA says: “*The lightweight, unique design can be easily integrated into any launch vehicle. Alba Orbital have made extensive use of 3D printing to lower the cost of the deployer, while still maintaining the demanding quality standards required for space. This is a key requirement for their target customers, who need low-cost reliable access to launch services.*”



The most innovative aspect of the project was the sheer number of components that are now produced through additive manufacturing - not only was the shell redesigned using 3D printing, but also the moving ejection mechanism and door assembly. (Image credit: Alba Orbital)

During the project the Alba Orbital/ARTES team were not only able to successfully demonstrate the AlbaPod 6p (6 units) through the deployment of PocketQubes in orbit, they also managed to reduce the weight of the AlbaPod by using aluminium and **windform** (a ground-breaking 3-D printing material); and then successfully integrate the AlbaPod with Rocket Lab’s Electron Launch Vehicle.

Tom Walkinshaw, Founder and CEO of Alba Orbital says: “*This ARTES project has seen the first flight opportunity for the AlbaPod – which is coincidentally also the first flight opportunity for Alba Orbital’s Unicorn-2 Satellite platform; another ESA project which is the most capable PocketQube platform in production.*”

Alba Orbital announced last week the successful integration of 9 PocketQube satellites ahead of their Alba Cluster 3 Launch, named ‘That time of year’, (in homage to the first annual ‘back-to-back’ PocketQube launch).

This exciting mission will launch the largest PocketQube cluster in history on a SpaceX Falcon 9 rocket in December 2020, including satellites from TU Delft, Ariel University, Zonguldak Bülent Ecevit University as well as more of Alba Orbital’s own Unicorn-2 PocketQube platforms.

Walkinshaw sums up the collaboration by saying: “*With ESA’s support this project demonstrates reliable, regular and affordable access to space for the PocketQube community and will allow Alba Orbital to grow revenues to 7 figures.*”





## Aerospace Manufacturing and Design



### CRP Technology manufactures 3D printed visor frame

Made in Italy protective face shields produced through selective laser sintering process and Windform FX BLACK polyamide-based material.

November 10, 2020



Posted by Elizabeth Engler Modic

Tecnoguarnizioni s.a.s (Soliera, Modena, Italy) for more than 40 years has been producing industrial flat gaskets of all sizes based on the customer's design.

In this period of major global crisis and health emergency, it is actively contributing to the fight against COVID-19 by creating new personal protective equipment (PPE).

#### The project

Tecnoguarnizioni's project consisted in the creation of two polycarbonate protective face shields models: one version (named Safe4U) for working environments; the other one (Safe4U +) to meet the requirement of the CE Mark for medical devices.

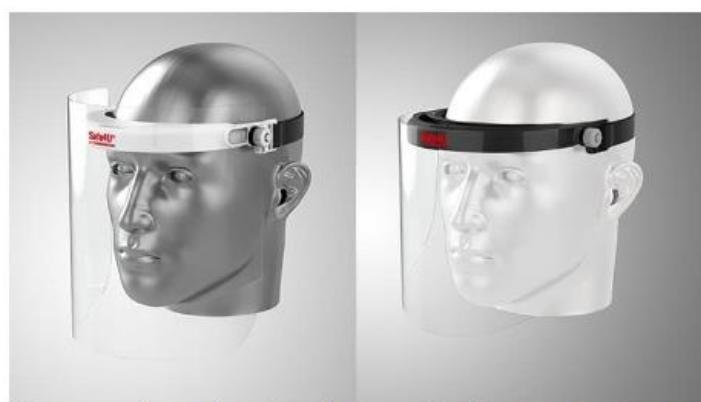
Both face protectors are equipped with a visor frame which, fastener to a rubber band, allows to wear the PPE while keeping your hands free to perform any action.

For the manufacture of the visor frame, Tecnoguarnizioni turned to CRP Technology and its technological solutions that combine speed of execution and optimal performance.

The Soliera-based company needed to obtain quickly the functional prototypes of the visor frames, in order to submit as soon as possible the final device to the CE certification process, and to finalize definitively the injection mold for industrial production, to avoid changes which would have involved huge waste of time and money.

More specifically, Safe4U is a personal eye and face protector, holed visor frame, with adjustable and transparent shield. It protects against high-speed particles, medium energy impact ( 120 m/s ).

It has a flip-up and replaceable shield and an easily adjustable elastic band.



(Left) Tecnoguarnizioni PPE Safe4U protective face shield (black). The functional prototypes of the visor frame were made by CRP Technology using selective laser sintering and Windform FX BLACK polyamide-based material. (Right) Tecnoguarnizioni PPE Safe4U+ protective face shield (white). The functional prototypes of the visor frame were made by CRP Technology using selective laser sintering and Windform FX BLACK polyamide-based material. Courtesy Tecnoguarnizioni



**Press Office Manager**  
**Veronica Negrelli**  
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**December 2020**

3D Printing Industry



#### 3D printing among the stars

2020 has been a major year for 3D printing in the aerospace sector. Aerospace company [Alba Orbital](#) recently successfully integrated [nine individual PocketQube](#) satellites into a 3D printed deployer, which is set to launch this month on a [SpaceX Falcon 9](#). Dubbed the AlbaPod V2, the structure was additively manufactured by 3D printing service bureau [CRP Technology](#), and is made of the company's own [Windform XT 2.0](#) high-performance composite material.



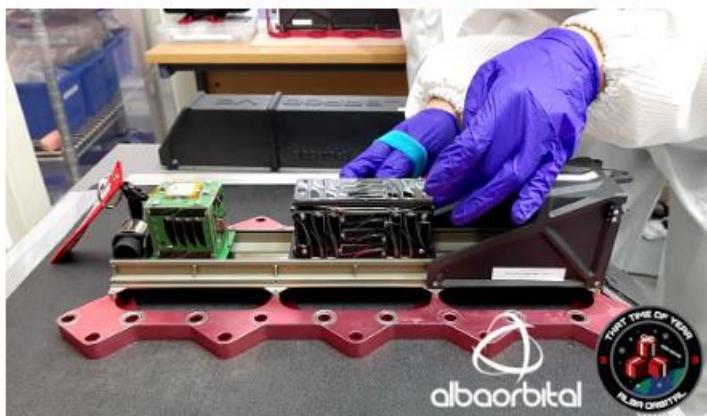
Tecne LAB

## TECNELAB

### Stampa 3D e materiali compositi di CRP contribuiscono al successo del sistema di rilascio satelliti ESA

0 21/12/2020 0 127 volta/e

Condividi Articolo



ESA, Agenzia Spaziale Europea, ha dedicato un articolo al sistema di rilascio avanzato di satelliti pocketqube AlbaPod V2 di Alba Orbital. Si tratta dell'unico deployer di microsatelliti, operativo e collaudato per lo spazio, attualmente sul mercato.

CRP Technology ha costruito la sua struttura e diversi particolari utilizzando la tecnologia della sinterizzazione laser selettiva e il materiale composito, caricato fibra di carbonio, Windform XT 2.0.

Tra pochi giorni AlbaPod V2 porterà in orbita 9 satelliti sul vettore Falcon 9 di SpaceX. Si tratta del più grande lancio di PocketQube nella storia fino a oggi.

L'articolo riporta le parole di Barnaby Osborne, Technical Officer del progetto ARTES per ESA: "AlbaPod V2 può essere facilmente integrato in qualsiasi vettore spaziale, grazie al suo design unico".

"Alba Orbital ha fatto un ampio uso della stampa 3D professionale per ridurre il costo del deployer, pur mantenendo gli esigenti standard di qualità richiesti per lo spazio", aggiunge Osborne.

Nell'articolo si evidenzia inoltre che "Alba Orbital è riuscita a ridurre il peso di AlbaPod grazie all'utilizzo dell'alluminio e di Windform XT 2.0, un materiale per la stampa 3D professionale veramente rivoluzionario".

Secondo quanto riportato nell'articolo, l'aspetto "più innovativo del progetto riguarda il numero di componenti realizzati in stampa 3D: non solo la copertura, ma anche il meccanismo di espulsione mobile e quello del montaggio della porta".



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PRESS RELEASES

## 3D printed satellite deployer in Windform XT 2.0 acclaimed for its mechanical features

By Press Releases - Dec 21, 2020



Recently Alba Orbital's AlbaPod V2 hyped up for its unique design, lightweight, easily integration into space launch vehicles, maintenance of the demanding quality standards for space. These characteristics have also made possible thanks to the use of AM and Windform XT 2.0 Carbon composite material

The European Space Agency (ESA) dedicated an article on Alba Orbital's cutting edge 3D printed satellite dispenser, AlbaPod V2, manufactured by CRP Technology using laser sintering technology and their patented Windform XT 2.0 Carbon-reinforced composite material.

AlbaPod V2 is currently the only operational, flight proven PocketQube Deployer on the market. In a few days 3D printed AlbaPod V2 will take 9 satellites to orbit on a SpaceX Falcon 9 launch vehicle. It will be the largest PocketQube launch in history to date. The article reported that Barnaby Osborne, Technical Officer of the ARTES project at ESA, says: "The lightweight, unique design of AlbaPod V2 can be easily integrated into any launch vehicle."

And again: "Alba Orbital have made extensive use of 3D printing to lower the cost of the deployer, while still maintaining the demanding quality standards required for space."

It is also highlighted that "Alba Orbital managed to reduce the weight of the AlbaPod by using aluminium and Windform XT 2.0, a ground-breaking 3-D printing material."

"The most innovative aspect of the project was – a caption reported – the sheer number of components that are now produced through additive manufacturing, not only was the shell redesigned using 3D printing, but also the moving ejection mechanism and door assembly."

All these parts were manufactured by CRP Technology in their plant in Modena, Italy.

"We are very proud – commented Engineer Franco Cevolini, VP and CTO CRP Technology – for us this article is a further, unequivocal proof of the successful use of Windform and AM supplied by CRP Technology in the manufacturing of flight-ready applications for the aerospace industry. We paved new roads in technological innovations for the most demanding industries and still do it, with passion and expertise."

The CRP Technology's technical knowledge in the aerospace sector, that allowed them to



## Additive Manufacturing Amazing

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+ DECEMBER 21, 2020

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Photo courtesy of CRP Technology

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## Manufacturing Tomorrow



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Visit <http://Crptechnology.com> for further information

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12/18/20, 05:27 AM | Additive & 3D Printing, Design & Development

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## Aerospace Manufacturing



# 3D printed satellite deployer acclaimed for mechanical features

22 DECEMBER 2020 • In News



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Compositi



#### CRP TECHNOLOGY

### CRP Technology at Pocketqube Workshop

CRP Technology has been at PocketQube Workshop 2020, the two-day event organized by Alba Orbital, as speaker and virtual exhibitor, on the theme of picosatellites (type of miniaturized satellites).

Furthermore, the company presented the report: "Composite Additive Materials for NanoSats' manufacturing".

Engineer Franco Cevolini, CTO and VP CRP Technology comments: "In the last few years 3D printing technology has reached new heights with the manufacture of structural components for the new generation of Space parts and structures. The uniqueness results have been obtained especially in the field of PocketQubes and CubeSats by using high performance composite materials, as our Windform® TOP-LINE family".

The paper highlighted the challenges related to making nanosatellite missions successful.

The advantages of using professional 3D printing and composite Carbon-or Glass-reinforced materials for the construction of nanosatellites structures had been discussed. It has been also shared an overview of some space missions that marked a new milestone in the 3D printed small satellite arena, such as Alba Pod V2, the 3D printed deployer for the world's most advanced picosatellites by Alba Orbital.

The 4th Annual PocketQube workshop is an international conference addressing the technical challenges associated with developing PocketQube technology for widening space access, shaping the future of space democratisation in the process.



Fig.1: 3D printed AlbaPod 2.0 on vibration table going through preflight certification



## Reinforced Plastics / Materials Today



### Carbon fiber

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## Satellite deployer made using 3D printed composite

27 December 2020

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CRP Technology reports that a satellite dispenser has been 3D printed using its Windform XT 2.0 carbon-reinforced composite material.

Plans are for the AlbaPod V2 to take nine satellites to orbit on a SpaceX Falcon 9 launch vehicle.

The parts were manufactured by CRP Technology in its plant in Modena, Italy.

The company's USA business has also used laser sintered composite material to make the TuPOD, reportedly the first complete 3D printed satellite deployer launched from the ISS, a 3D printed 3U CubeSat and a dispensing system for two tube satellites, and the Discovery 1a, a space-ready functional prototype.



The 3D printed AlbaPod 2.0 on a vibration table going through preflight certification. (Photo courtesy Alba Orbital.)

*This story uses material from CRP, with editorial changes made by Materials Today. The views expressed in this article do not necessarily represent those of Elsevier.*



Tecne LAB

# TECNELAB

## CRP Technology realizza i supporti per le visiere protettive di Tecnoguarnizioni

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Condividi Articolo



Per la realizzazione del sostegno ad arco, a completamento delle proprie visiere, Tecnoguarnizioni si è rivolta a CRP Technology e alle sue soluzioni tecnologiche.

Per disporre di supporti a completamento dei propri DPI, Tecnoguarnizioni si è rivolta a CRP Technology, che ha fornito questi componenti velocemente grazie all'esperienza nella stampa 3D e all'utilizzo del materiale Windform® FX Black.

di Carlo Martelli

Attraverso il processo di sinterizzazione laser selettiva e il materiale a base poliammidica Windform® FX Black, CRP Technology ha realizzato per Tecnoguarnizioni l'archetto di due DPI utilizzabili in qualsiasi ambito professionale e in presidi medici e ospedalieri. La velocità di esecuzione e la funzionalità dei pezzi in Windform® hanno permesso ai dispositivi di essere certificati in breve tempo.

Tecnoguarnizioni s.a.s è un'azienda italiana con sede a Soliera, in provincia di Modena, che da oltre 40 anni produce guarnizioni piane industriali. In questo periodo di crisi sanitaria ha deciso di contribuire attivamente alla lotta contro il Covid-19 realizzando nuovi dispositivi di protezione individuale (DPI). "Ci siamo rimboccati le maniche andando incontro alle esigenze comuni, abbiamo potenziato il nostro lavoro unendo le competenze acquisite e valorizzando quello che per noi era già una normale produzione", spiega Sandro Righi, Titolare, insieme a Gianluca Venuta, di Tecnoguarnizioni.



Safe4U è una visiera protettiva regolabile e trasparente con supporto/archetto aperto (dotato di foro), atta a